

TEST RESULT SUMMARY

FCC PART 15 SUBPART C Section 15.247 Industry Canada RSS-210: Issue 5: 2001 A1: Nov. 2002, A2: Apr. 2003, A3: 2004, A4: 2004 Section 6.2.2(o)

MANUFACTURER'S NAMEDigi InternationalNAME OF EQUIPMENTDigi Connect Wi-SP with Dipole antenna or with
Desktop antenna and extension cableTYPE OF EQUIPMENT802.11B 11 Mbit 2.4 GHz radio transceiver to
single serial port converter with 2 antenna optionsMODEL NUMBER50001312-01 Rev 01MANUFACTURER'S ADDRESS11001 Bren Road East
Minnetonka, MN 55343TEST REPORT NUMBERWC500423.1 Rev A

TEST DATE

02 & 03 February 2005

According to testing performed at TÜV Product Service Inc, the above-mentioned unit is in compliance with the electromagnetic compatibility requirements defined in FCC Part 15 Subpart C Section 15.247 and RSS-210, section 6.2.2(o).

It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

TÜV Product Service Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the requirements of FCC Part 15 Subpart C Section 15.247 and RSS-210, section 6.2.2(o).

Date: 22 April 2005

Location: Taylors Falls MN USA

Par M. John

Thomas K. Swamon

T. K. Swanson Reviewed By

Tested By

R. M. Johnson

Not Transferable



EMCEMISSION - TEST REPORT

Т

Test Report File No.	:	WC500423.1 Rev A	Date of issue:	22 April 2005	
Model No.	:	50001312-01 Rev	/ 01		
Product Name	:	Digi Connect Wi-S antenna and exte	SP with Dipole a nsion cable	antenna or with Desktop	
Product Type	:	802.11B 11 Mbit 2 port converter wit	2.4 GHz radio tr h 2 antenna opt	ansceiver to single seria	al
Applicant	:	Digi International			
Manufacturer	<u>.</u>	Digi International			
License holder	<u> </u>	Digi International			
Address	:	11001 Bren Road	East		
	:	Minnetonka, MN	55343		
Test Result	:	■ Positive □	Negative		
Test Project Number Reference(s)		WC500423.1 Rev A			
Total pages		50			
TÜV Product Service Inc is a subcontrac EN 45001.	tor to TÜV	/ Product Service, GmbH accord	ling to the principles outlin	ed in ISO/IEC Guide 25 and	
TÜV Product Service Inc reports apply o responsibility to assure that additional pr components. TÜV Product Service Inc s from TÜV Product Service Inc issued rep	nly to the s oduction us shall have ports.	specific samples tested under si inits of this model are manufactu no liability for any deductions, in	tated test conditions. It is a ured with identical electricated with identical electricated ferences or generalization	he manufacturer's I and mechanical s drawn by the client or others	
This report is the confidential property of report shall not be reproduced except in endorsement by NVLAP or any agency of	the client. full withou of the US g	As a mutual protection to our t our written approval. This repo government.	clients, the public and our ort shall not be used by the	elves, extracts from the test client to claim product	
TÜV anı	Product Se d profession AAMI, A	rvice Inc and its professional staff ho. al organization certifications and are CIL, AEA, ANSI, IEEE, NVLAP, and	ld government members of VCCI		
			File I	No. WC500423.1 Rev A, Pag	e 1 of 50
ÜV PRODUCT SERVICE INC 19333 Wild M	lountain F	Road Taylors Falls MN 5	5084-1758 Tel: 65	i1 638 0297 Fax: 651 638 0298	Rev.No 1.0



REVISION RECORD

REVISION	TOTAL NUMBER OF PAGES	DATE	DESCRIPTION
	49	14 March 2005	Initial Release
A	50	22 April 2005	 Revisions include: Added information on the 2 antenna models on the test result summary page and pages 1 and 9.



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Test data	FCC Section	RSS-210 Section	
Maximum Power Output	15.247 (b)(3)	6.2.2(o)(b)	15 - 19
6 dB Bandwidth	15.247 (a)(2)	6.2.2(o) Amd. 1 (IV)	20 - 23
99% Bandwidth	N/A	5.9.1	24 - 27
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Rev.No 1.0



EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

- □ EN 50081-1 / 1991
- 🗆 EN 55011 / 1998
- w/Amendment A1:1999
- 🗆 EN 55013 / 1990
- 🗆 EN 55014 / 1987

□ - Group 1 □ - Class A □ - Group 2 □ - Class B

Class B

- $\hfill\square$ Household appliances and similar
- Portable tools
- \square Semiconductor devices

- □ EN 55014 / A2: 1990
- 🗆 EN 55014 / 1993

- Household appliances and similar
- Portable tools

Class A

- Semiconductor devices

- 🗆 EN 55015 / 1987
- □ EN 55015 / A1:1990
- □ EN 55015 / 1993
- 🗆 EN 55022 / 1987
- - FCC Part 15 Subpart C Section 15.247
- □ FCC Part 15 Subpart C Section 15.247
- - RSS-210, Issue 5, 2001 Section 6.2.2(o)



Emission	Test Results:		
Peak Powe	r Out [FCC 15.247 (b)(3)], [RSS-210 6.	2.2(o)(b)]	
The require	ments are	■ - MET	🗆 - NOT MET
Maximum pe	eak power output shall be 1 watt.		
Remarks:	Max peak output power is measured to	be 23.63 dBm (230.6 r	mW).
6 dB Bandv	width [FCC 15.247 (a)(2)], [RSS-210 6.2	2.2(o) Amd. 1 (IV)]	
The requirer	ments are	■ - MET	🗆 - NOT MET
The minimu	m 6 dB bandwidth shall be at least 500 l	κHz.	
Remarks:	Bandwidths are shown to be 9.35 to 9.9	5 MHz.	
99% Bandw	vidth [RSS-210 5.9.1]		
The requirer	ments are	■ - MET	- NOT MET
The minimu	m		
Remarks:	Bandwidths are shown to be 13.18 to 14	4.8 MHz.	
Power Spe	ctral Density – [FCC 15.247 (e)], [RSS	-210 6.2.2(o) Amd. 1 (IV)]
The require	ments are	■ - MET	- NOT MET
Peak power	spectral density shall not be greater that	n 8 dBm in any 3 kHz	band.
Remarks:	Maximum peak power spectral density i	s -13.34 dBm/3 kHz.	
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The requirements are		
Demonstrate The limit is 20 dDe in sect 400 black		
Remarks: I ne limit is -20 dBc in any 100 kHz band ou	itside the operating b	band.
Special attention is paid to ensure band edge compliand	ce.	
Spurious radiated emissions (electric field) 30 MHz	- 1000 MHz (restrict	ed bands) [FCC 15.247 (d)]
The requirements are		
Minimum margin of compliance	<u>>10</u> dB	at MHz
Maximum margin of non-compliance	dB	at MHz
Remarks: Meets FCC 15.209 limit. No emissions det	ected above the nois	e level of the measuring
system.		
Spurious radiated emissions 1 GHz – 25 GHz (restr	icted bands) [FCC 1	[5.247 (d)]
The requirements are	■ - MET	
Minimum margin of compliance	<u> </u>	at <u>18.0</u> GHz
Maximum margin of non-compliance	dB	at MHz
Remarks: Meets FCC 15.209 limit. No emissions det	ected above the nois	e level of the measuring
system.		
AC Line Conducted emissions 150 kHz - 30 MHz [FC	C 15.207], [RSS-21	0 (CISPR 22)]
The requirements are	■ - MET	□ - NOT MET □ - N/A
Minimum margin of compliance	<u>8</u> dB	at <u>298.4</u> kHz
Maximum margin of non-compliance	dB	at MHz
Remarks:		
Receiver Spurious Radiated Emissions [FCC 15.109]	
The requirements are	■ - MET	🗆 - NOT MET
Minimum margin of compliance	<u>>10</u> dB	at MHz
Maximum margin of non-compliance	dB	at MHz
Maximum margin of non-compliance		
Remarks: Meets FCC 15.209 limit. No emissions det	ected above the nois	e level of the measuring



MEASUREMENT PROTOCOL

GENERAL INFORMATION

Environmental conditions in the lab: TUV America Small Test Site

	Actual
Temperature	: 10 °C
Relative Humidity	: 35 %
Atmospheric pressure	: 98.0 kPa
Power supply system	: 60 Hz - 110 VAC - 1 Phase

Test Methodology

Conducted and radiated emission testing is performed according to the procedures in International Special Committee on Radio Interference (CISPR) Publication 22 (1993), European Standard EN 55022 and Australian Standard AS 3548 (which are based on CISPR 22).

The Japanese standard, "Voluntary Control Council for Interference (VCCI) by Data Processing Equipment and Electronic Office Machines, Technical Requirements" is technically equivalent to CISPR 22 (1993). For official compliance, a conformance report must be sent to and accepted by the VCCI.

In compliance with FCC Docket 92-152, "Harmonization of Rules for Digital Devices Incorporate International Standards", testing for FCC compliance may be done following the ANSI C63.4-2001 procedures and using the CISPR 22 Limits.

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. These test systems have a measurement uncertainty of ± 4.8 dB. The equipment comprising the test systems are calibrated on an annual basis.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into it's characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

CONDUCTED EMISSIONS

The final level, expressed in $dB\mu V$, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the CISPR limit.

To convert between dB μ V and μ V, the following conversions apply: dB μ V = 20(log μ V) μ V = Inverse log(dB μ V/20)

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RADIATED EMISSIONS

The final level, expressed in $dB\mu V/m$, is arrived at by taking the reading from the spectrum analyzer (Level $dB\mu V$), adding the antenna correction factor and cable loss factor (Factor dB) to it, then subtracting the preamp gain. This result then has the CISPR limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets in Attachment A.

Example: FREQ (MHz)	LEVEL (dBuV)		CABLE/ANT/PREAMP (dB) (dB/m) (dB)	FINAL (dBuV/m)	PO	L/HG1 (m)	Г/AZ (deg)	DELTA1 EN 55022 A
60.80	42.5Qp	+ 1.2	+ 10.9 - 25.5 =	29.1	V	1.0	0.0	-10.9

DETAILS OF TEST PROCEDURES

General Standard Information

The test methods used comply with ANSI C63.4-2001 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

Conducted Emissions

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω /50 μ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. In some cases, a pre-scan using a spectrum analyzer is initially performed on the units comprising the system under test to locate the highest emissions. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are re-measured using a tuned receiver or spectrum analyzer with quasi-peak and average detection and recorded on the data sheets.

Radiated Emissions

Radiated emissions from the EUT are measured in the frequency range of 30 to 25000 MHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 3, 10 or 30 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees. The transmitter is rotated through 3 orthogonal axes in order to determine the maximum emission levels.



DEVIATIONS FROM STANDARD:

None

GENERAL REMARKS:

The Digi Connect Wi-SP is available with 2 antenna options of the same type.

One option is the dipole antenna (Digi part number DC-ANT-24DP). It is connected to the product with a reverse polarity SMA connector (sub-miniature size). The antenna only fits on the product one way to ensure a proper connection. This antenna has a gain of 2 dBi.

Another option is to use the desktop antenna (Digi part number DC-ANT-24DT) along with a 30 cm extension cable (Digi part number DC-ANT-E-24DP). This antenna has a gain of 1.8 dBi and the cable has a loss of 0.5 dB.

Testing was performed on the EUT using the dipole antenna, which has the higher gain.

SUMMARY:

The requirements according to the technical regulations are

- met

□ - **not** met.

The device under test does

- I fulfill the general approval requirements mentioned on page 3.
- □ **not** fulfill the general approval requirements mentioned on page 3.

Testing Start Date:

02 February 2005

Testing End Date:

02 February 2005

- TÜV PRODUCT SERVICE INC -

Thomas K. Swamon

Reviewed By: T. K. Swanson

Ren M. John

Tested By: R. M. Johnson

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Tel: 651 638 0297

Taylors Falls MN 55084-1758



Constructional Data Form(s)

and/or

Product Information Form(s)

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 TÜV PRODUCT SERVICE INC
 19333 Wild Mountain Road
 Taylors Falls MN 55084-1758
 Tel: 651 638 0297
 Fax: 651 638 0298
 Rev.No 1.0



Company Addre	ss: 11001 Bren Road East Minnetonka, MN 55343					
Digi Engineering	Ph: (952) 912-3444 Fax: (952) 912-4955 g Contact: Bill Kumpf Phone: 952-912-3444					
Digi Homologati	ion Contact: Bill Kumpf Phone: 952-912-3444					
Equipment Unde	er Test: Digi Connect Wi-SP 802.11b radio to serial converter module.					
Model Number:	50001312-01 Rev: 01 (50001312-xx) 01					
(do not use 30m p/n) Serial Number:	00001					
Test Laboratory	TUV Wild river Test Date: Jan 7, Feb 2^{nd} , 3^{rd} , 4^{th} , 10^{th} 2005					
Type of Test:	□ Development EN55022:1998/FCC Class B Emissions X Initial Design Verification EN55022:1998/FCC Class A Emissions □ Design Change Korea No. 1996-18 (based on CISPR 22) □ Production Sample (Audit Test) □ Taiwan CNS 13438:1997 □ Other □ EN55024:1998 IT & Telecom Immunity □ EN61000-3-2,3 Supply Harmonics/Flicker □ ETS 301 489-3					
	EMC – Wireless (Intentional)EMC – Wireless (Unintentional)					
	x ETS 300 328 (Europe) ETS 300 826 (Europe) x FCC Part 15.247, 15.249 / RSS 139, 210 X FCC Part 15, Class B / ICES 003, Class B ARIB T66 (RCR STD-33) - Japan X VCCI, Class B - Japan					
Documentation Requested:XEN55022:1998 Test Report (FCC Style)□Austel EMC Report□International EMC ReportFCC Test ReportEN55024: 1998 Test Report□Taiwan CNS 13438:1997 Test Report□Korea No. 1996-18 Report□EN61000-3-2, 3:1995□Test Results Summary□ETS 300 328 (Europe)□ETS 301 489-3 ImmunityXFCC Part 15.247, 15.249/RSS 139, 210□						
Equipment Desc	Equipment Description: 802.11B 11 Mbit 2.4 GHz radio transceiver to single serial port converter					
Design Changes Oscillator Frequ	Made (if applicable): encies: 18.432 MHz, 44Mhz, 2.4GHz pll					

Power Interface	AC Power Cable	DC Power Cable
Fraguanau: Uz	Hardwired Flexible Shielded Unshielded Attached Removable	Hardwired Flexible Shielded Unshielded Attached Removable
Voltage: V	Length Ft.	Length Ft.
Current A	<u> </u>	<u> </u>
# of Phases:		
Power Line Filter: Ma	nufacturer: Model Number:	
Power Supply:		
Description: 12V dc suppl	ied by external brick or wall mounted supply	
Manufacturer: N/A		
Model Number: <u>N/A</u>		
Switching Frequency: <u>N</u>	/A	
If a Ferrite Bead is used	on the AC line cord, give location or	ı cable:
N/A		
If a Ferrite Bead is used	on the DC line cord, give location or	ı cable:
N/A		
Housing or Cabinet Type	e: Plastic x Metallized \Box Host Board Only, Housed in PC	Metal Other 🗆

Cabinet Shielding Provision : N/A

Interfacing Equipment or Simulators

Description	Model Number	Serial Number	FCC ID#
Linksys access point	WAP11	G3110304780	07JGL2411AP
IBM Think Pad PC	Type 2611	AA-DVBCD	7K85E145483 3872B567

I/O Cables

Function	Length	Quantity	Location	Туре	Shield Termination
SERIAL CABLE	1M	1	Connected to UUT	SHIELDED	CONNECTOR SHELL

Block Diagram:



Constructional Data Form for EMC-certificate testing

TÜV Product Service Inc 1775 Old Highway 8 New Brighton MN 55112-1891



Telephone612 631 2487Telefax612 631 3515

Address: 11001 Minnet Type of equipment Type No./model	Bren Road East onka MN 55343 802.11B 11 Mbit 2.4 GHz radic transceiver to single serial port	Rated voltage		
<u>Minnet</u> Type of equipment Type No./model	onka MN 55343 802.11B 11 Mbit 2.4 GHz radic transceiver to single serial port	Rated voltage		
Type of equipment Type No./model	802.11B 11 Mbit 2.4 GHz radic transceiver to single serial port	Rated voltage		
Type No./model	converter	Rated Voltage	12VDc	
	Wi-SP 50001312-01	Rated input power	3W Max	
		Protection class	na	
Check the appropriate	2:			
Kind of interference Broadband interf	erence x Narrowband int	erference C	lick interference	
Repetition frequenc <10 kHz	y: x >10 kHz			
Sources of interferen (e.g. motor, switch m Quartz oscillator ¹) Internal frequencie (e.g. clock frequen	nce ode power supply, quartz oscillato rs <u>18.432 MHz, 44M</u> cy, deflection frequency, switching	r) hz, 2.4GHz pll g frequency)		
¹) Devices used for R manufacturer and mo	FI suppression (include del no.)	na		
		na		
) Measures for elect	romagnetic shielding			
(menude type, manula		na		
¹) External interfaces (include manufacture	and connections r and model no.)			
	,	FCC software "H"'s on se	rial	
¹) Description of mod	les or operation during test	port and across radio link		
		manufacto Dan da esta L. C († 17		
·) Please include detailed i	nformation and if applicable, refer to the ap	propriate Product Information Form	n or attachment	
data		date		







Maximum Power Output

Specifications:

FCC Specification: Paragraph: 15.247 (b)(3) IC Specification: RSS-210, 6.2.2(o)(b)

The MAXIMUM POWER OUTPUT measurements were performed at the following test location:

□ - Test not applicable

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- □ Oakwood Lab (Open Area Test Site)

□ - Wild River Lab Screen Room

Test equipment used :

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3334	8542C	Giga-tronics	Peak Power Meter	1831096	02-Apr-05
3336	80350A	Giga-tronics	Peak Power Sensor	1822765	27-May-05
Cal Code E	3 = Calibration verifica	tion performed internally. C	al Code Y = Calibration not required w	hen used with other calibra	ted equipment.

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

★ Agilent 15:33	3:01 Feb 2, 2005		Trace
Ch F Channel Power	req 2.412 GHz	Trig Free	Trace <u>1</u> 2 3
Center 2.4	12000000 GHz		Clear Write
Ref 30 dBm	Atten 40 dB	Mkr1 2.412 0 GHz 23.63 dBm	
Log		*	Max Hold
dB/			Min Hold
Center 2.412 0	GHz	Span 100 MHz	View
Res BW 8 MHz Channel Pow	*VBW 50 MHz ver	*Sweep 1 ms (1001 pts) Power Spectral Density	Blank
21.86 dB	m / Lu.uuuuu mhz	-48.14 dBm/Hz	
21.86 dB	m /10.000 mHz	-48.14 dBm/Hz	

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PEAK POWER SPECTRAL DENSITY -48.14 dBm/Hz +34.8 - 13.34 aBm/3KHZ vs. limit of +8dBm

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🔆 Agilent 15:14:3	6 Feb 2, 2005						Marker
Ch Fre Channel Power	2. 462 GHz				Trig	I Free	Select Marker <u>1</u> 234
Marker 2.462	2000000 GH	Z		Mkr1	2.462	0 GHz	Normal
Ref 30 dBm	Atten 40 dB	K 1 1		E 1	15.4	1 dBm	
						*_	Delta
dB/				Where my water	******		Delta Pair (Tracking Ref) Ref ▲
Center 2.462 0 GH;	2				Span 10)0 MHz	Span Pair Span <u>Center</u>
*Kes BW 1 MHZ Channel Power	*AR	N 8 MHz	*Swe Power	specti	ral Dei	1 pts) nsity	Off
20.44 dBm	/10.0000 M	Hz	-49	9.56	dBm/	Ήz	More 1 of 2
Trace smoothing:	/BW filt or Aver	age Dete	ctor; car	nnot us	e both)	
CH-1	1 MAR	<u>Wis</u> REAK	2 (50 6 00	9013 TRU	12-1	n)	ER

FCC PWR SETTING - 15

PEAK POWER SPECTRAL DENSITY

🔆 Agilent 15:25:44	Feb 2, 2005		Freq/Channel		
Ch Freq Channel Power	2.437 GHz	Trig Free	Center Freq 2.43700000 GHz		
Center 2.437	000000 GHz	Mkr1 2.437 0 GHz	Start Freq 2.38700000 GHz		
Ref 30 dBm #Peak Log	Atten 40 dB	22.25 dBm	Stop Freq 2.48700000 GHz		
dB/			CF Step 10.0000000 MHz <u>Auto</u> Man		
Center 2.437 0 GHz	*URU 50 MH-	Span 100 MHz	FreqOffset 0.00000000 Hz		
Channel Power		Power Spectral Density	Signal Track On <u>Off</u>		
21.43 dBm /	21.43 dBm /10.0000 MHz -48.57 dBm/Hz				
Printer not respon	ding				
CH-6	MAX PEA	X (50001312-01) K OUTPUT POW	ER		
Fcc	PWR SETTIN	16-15			

PEAK POWER SPECTRAL DENSITY

-48.57 dBm/HZ + 34.8 -13.77 dBm/3KHZ



6 dB Bandwidth

Specifications:

FCC Specification: Paragraph: 15.247 (a)(2) IC Specification: RSS-210, 6.2.2(o) Amd. 1 (IV)

The 6 dB Bandwidth measurements were performed at the following test location:

□ - Test not applicable

- □ Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)

□ - Oakwood Lab (Open Area Test Site)

□ - Wild River Lab Screen Room

Test equipment used :

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3367	E4440A	Agilent	Spectrum Analyzer	MY43362222	25-Aug-05
Cal Code I	B = Calibration verifica	tion performed internally.	Cal Code Y = Calibration not required w	when used with other calibra	ated equipment.

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.



CH1-1	WISP (50001312-01)
Fcc	-608 BW = 9.35 MHz



CH-6 FCC WiSP (50001312-01)

- Led B BW= 9,35 MHz





20dB Bandwidth

Specifications:

FCC Specification: N/A IC Specification: RSS-210, 5.9.1

The 20 dB Bandwidth measurements were performed at the following test location:

- Test not applicable

□ - Wild River Lab Large Test Site (Open Area Test Site)

- Wild River Lab Small Test Site (Open Area Test Site)

□ - Oakwood Lab (Open Area Test Site)

- Wild River Lab Screen Room

Test equ	uipment used :				
TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3367	E4440A	Agilent	Spectrum Analyzer	MY43362222	25-Aug-05
Cal Code E	B = Calibration verification	ation performed internally.	Cal Code Y = Calibration not required w	when used with other calibra	ated equipment.

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

CH-11 -ZODB BW PLDT



CH-6 - ZOUB BW PLOT



CANADA CH-6 - ZODBBW = 1458 MHz

CH-1-ZOUG BANDWIDTH PLOT





Power Spectral Density

Specifications:

FCC Specification: Paragraph: 15.247 (e) IC Specification: RSS-210, 6.2.2(o) Amd. 1 (IV)

The Power Spectral Density measurements were performed at the following test location:

□ - Test not applicable

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)

□ - Oakwood Lab (Open Area Test Site)

□ - Wild River Lab Screen Room

Test equipment used :

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3367	E4440A	Agilent	Spectrum Analyzer	MY43362222	25-Aug-05
Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibration					ated equipment.

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

* Agilent 15:33:	:01 Feb 2, 2005		Trace
Ch Fr Channel Power	eq 2.412 GHz	Trig Free	Trac 1 2
Center 2.4	12000000 GHz		Clear Write
Ref 30 dBm	Atten 40 dB	Mkr1 2.412 0 GH	Z
*Peak		25.05 ubi	Max Hole
dB/			Min Hole
Center 2.412 0 G	Hz	Span 100 MH;	Viev
*Res BW 8 MHz	*VBW 50 MHz	*Sweep 1 ms (1001 pts)	Dise
Channel Powe	r	Power Spectral Density	Bian
21.86 dBm	1 /10.0000 MHz	-48.14 dBm/Hz	
		1928 - Tanana - Angelan Santa -	
Printer not resp	ponding		······································
	wi	58 (5000137-01)
H-1	MAX PEAK	OUTPUT POWA	ER

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PEAK POWER SPECTRAL DENSITY -48.14 dBm/Hz +34.8 - 13.34 aBm/3KHZ vs. limit of +8dBm

•

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* Agilent 15:14:36	Feb 2, 2005				Marker
Ch Freq Channel Power	2.462 GHz		1	rig Free	Select Marker <u>1</u> 2 3 4
Marker 2.4620	100000 GHz		Mkr1 2.	462 0 GHz	Normal
Ref 30 dBm	Atten 40 dB		1	5.41 dBm	
Heak Log				*_	Delta
dB/			Were Prove		Delta Pair (Tracking Ref) Ref ≜
Center 2.462 0 GHz			Spar	n 100 MHz	Span Pair Span <u>Center</u>
Channel Power	*VRM 8 M	Hz #Sw Power	spectral	Density	Off
20.44 dBm //	10.0000 MHz	-4	9.56 dB	m/Hz	More 1 of 2
Trace smoothing:VB	N filt or Average I	Detector; ca	nnot use b	oth	
CH-11	MAX 8E	<u>59</u> (50 AK OU	001312 TPUT	01) Pow	ER

FCC PWR SETTING - 15

PEAK POWER SPECTRAL DENSITY

🔆 Agilent 15:25:44 Fe	eb 2, 2005		Freq/Channel				
Ch Freq Channel Power	2.437 GHz	Trig Free	Center Freq 2.43700000 GHz				
Center 2.43700	10000 GHz	Mkr1 2.437 0 GHz	Start Freq 2.38700000 GHz				
Ref 30 dBm At #Peak Log	ten 40 dB	22.25 dBm	Stop Freq 2.48700000 GHz				
dB/			CF Step 10.0000000 MHz <u>Auto</u> Man				
Center 2.437 0 GHz #Res BW 8 MHz	#\/B\ 50 MHz	Span 100 MHz *Sween 1 ms (1001 nts)	Freq Offset 0.00000000 Hz				
Channel Power		Power Spectral Density	Signal Track On <u>Off</u>				
21.43 dBm /10	0.0000 MHz	-48.57 dBm/Hz					
Printer not respondin	g						
CH-6 MAX PEAK OUTPUT POWER							
FCC	WR SETTIN	6-15					

PEAK POWER SPECTRAL DENSITY

-48.57 dBm/HZ + 34.8 -13.77 dBm/3KHZ



Conducted Out of Band Emissions

Specifications:

FCC Specification: Paragraph: 15.247 (d) IC Specification: RSS-210, 6.2.2(o)(e1)

The Out of Band Emission measurements were performed at the following test location:

□ - Test not applicable

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)

□ - Oakwood Lab (Open Area Test Site)

□ - Wild River Lab Screen Room

Test equipment used :

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3367	E4440A	Agilent	Spectrum Analyzer	MY43362222	25-Aug-05
Cal Code I	B = Calibration verifica	ation performed internally.	Cal Code Y = Calibration not required	when used with other calibr	ated equipment.

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.



Marker							, 2005	Feb 2	:38:46	ilent 14	🔆 Ag	
Select Marker	42 GHz .86 dB	lkr1 2. -50.	۸M	1			40 dB	#Atten	r	dBm	Ref 30 Norm	
Normal	*		-						2		Log 10 dB/	
Doito									·		407	-
Della									ier a	Mark	·	ode
Delta Pair (Tracking Ref)							GHz	000	0000	2.42		
Ref <u>A</u>	,							B	86 d	-50.	LgAv	
Span Pair Span <u>Center</u>									4		V1 S2 \$3_ F£	Bm-
Off	MARRIAN PARTY	apad <u>pad</u> je til je	i, gydd yn	alan an a	- in a share	Angel Angel And	li ali ali ali ali ali ali ali ali ali a	distant for	a transmit	*****	£(f): FTun ≢Sup	
								<u>,</u>			+γ#h	
More 1 of 2	97 GHz^ 1 pts)	an 24.9 s (100	Sp 3.011	Ѕ₩еер	kHz	W 100	∗ VB		GHz kHz	12.52 W 100	Center #Res B	
			d	loade	TA file	106.5	STATE	us, C:'	n Stat	eratio	File Op	
001312-0	(50	SP	Ni				15	O	RI	ρ_{v}	5	
				-						Ò		
									- 1	PН		

FCC . EUROPE





FCC + EUROPE

M-6

skrictor)

Marker							, 2005	Feb 2	1:47:29	ilent 14	🔆 Ag
Select Marker <u>1</u> 234	.47 GHz .26 dB	kr1 2. -44	▲ M	1	r		40 dB	#Atten	1	dBm	Ref 30 Norm
	*										Log
Normal		-							.R	1	10 dB/
Delte									}	•	
Deita									l ′or A	Marl	DI
Delta Pair (Tracking Ref)							GHz ⁻	000	0000	2.47	-13.5 dBm
Ref <u>A</u>								B	.26 d	-44	LgAv
Span Pair								• •			V1_S2 S3_FC
	Laine										AA AA
Off			ar ar da i dha i la a			asa milan da milano	4.4.94 8.8	pallatter at a stall	wi ^{nyi} atiyin	ng fili the states of the stat	FTun #Swp
More	97.011-0	on 24.	<u> </u>							1252	Contor
1 of 2	37 0HZ)1 pts)	s (100	3.011	Ѕ₩еер	kHz	3W 100	∗ VB		kHz	W 100	*Res B
			d	e loade	TA file	106.5	STATE	us, C:'	on Stat	perati	File Op

CH-11

FCC + EUROPE



Radiated Emissions in Restricted Bands

Specifications:

FCC Specification: Paragraph: 15.247 (d) IC Specification: N/A

The Radiated Emissions in Restricted Band measurements were performed at the following test location:

□ - Test not applicable

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- □ Oakwood Lab (Open Area Test Site)
- □ Wild River Lab Screen Room

Test equipment used :

	Model Number	Manufacturer	Description	Serial Number	Cal Due
3203	EM-6917B	Electro-Metrics	Biconicalog Periodic	106	30-Mar-05
2680	85650A	Hewlett-Packard	Quasi-Peak Adapter (Unit B)	2043A00343	10-May-05
3809	8566B	Hewlett-Packard	Spectrum Analyzer	3026A19165	20-Mar-05
3810	85662A	Hewlett-Packard	Analyzer Display	3014A06698	20-Mar-05
2665	ZHL-1042J	Mini-Circuits	Preamplifier	32296	Code B
					08-Feb-05
3957	SL18B4020	Phase One Microwave	Preamplifier 1 – 18 GHz	0001	Code B
					17-Oct-05
2075	3115	Electro-Mechanics (EMCO)	Ridge Guide Ant. 1-18 GHz	9001-3275	24-Nov-05
2478	AWT-18037	Avantek	Preamplifier 8-18 GHz	1001-9226	Code B
					24-May-05
2127	11975A	Hewlett Packard	Amplifier 2-8 GHz	2738A01200	Code B
					25-May-05
2662	11970K	Hewlett-Packard	Harm Mixer – 18-26.5 GHz	2332A01170	11-Jul-06
2788	3116	Electro-Mechanics	Ridge Guide Ant 18-40 GHz	2005	27-Sep-05
		(EMCO)			

Cal Code B = Calibration verification performed internally.

Cal Code Y = Calibration not required when used with other calibrated equipment.

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

File No. WC500423.1 Rev A, Page 36 of 50

RADIATED EMISSIONS



Test Report	#: WC50042	23 Run 1	Test Area:	STS				
EUT Model	#: WiSP		Date:	2/3/2005				
EUT Serial	#: <u>N/A</u>		EUT Power:	60Hz/110VAC	Tempera	ature:	10.0	°C
Test Metho	d: FCC 15.2	47			Air Pres	sure:	98.0	kPa
Custome	er: DIGI INT'	L			Rel. Hum	nidity:	35.0	%
EUT Descriptio	n: 802.11b 7	O SERIAL CONVERTER N	NODULE					
Note	s: TRANSM	ITTER RESTRICTED BANI	D SCAN. (ANT	ENNA ON TRANSM	1ITTER)			
Data File Nam	e: 0423.dat					Page:	1 of	1
List of mea	asureme	nts for run #: 1						
FREQ	LEVEL	CABLE / ANT / PREAMP	P/ FINAL	POL / HGT	AZ DELTA1		DELT	A2
	(dBuV)	ATTEN (dB)	(dBuV /	m) (m)(DEG) FCC-B <1G 3m	iHz FC	< C B کر 3m	1GHz
NO SPURIOUS	EMISSIONS F	OUND V OR H PÓLARIZAT	TION AT ALL A	ZIMUTHS 1 - 4 ME	TERS.			

Tested	by:
--------	-----

Reviewed

by:

END OF SCAN 30 MHz - 25GHz.

RMJ

Rus M. John

Printed

TKS

Printed

Thomas K. Swamon

Signature

File No. WC500423.1 Rev A, Page 37 of 50

RADIATED EMISSIONS



EUT Model #: WiSP Date: 2/3/2005	
EUT Serial #: N/A EUT Power: _60Hz/110VAC Temperature: _10.0	°C
Test Method: EN 55022 Air Pressure: 98.0	kPa
Customer: DIGI INT'L Rel. Humidity: 35.0	%
EUT Description: 802.11b TO SERIAL CONVERTER MODULE	
Notes: TRANSMITTER SPURIOUS CASE RADIATION SCAN (LOW & HIGH CHANNELS INVESTIGATED)	
Data File Name: 0423-2.dat Page: 1 of	1
List of measurements for run #: 4	
FREQ LEVEL CABLE / ANT / PREAMP / (dBuV) FINAL (dBuV / m) POL / HGT / AZ (m)(DEG) DELTA1 DELTA1	42
NO SPURIOUS EMISSIONS FOUND ON LOW OR HIGH CHANNEL W/ V OR H POLARIZATIONS AT ALL AZIMUTHS 1-4 MTF	S.

END OF SCAN 30 MHz - 12.75GHz.

Tested by:

Reviewed

by:

Paul M. Jahan Signature

Printed

TKS

Printed

RMJ

Thomas K. Swamon

Signature



Radiated Emissions in Restricted Bands (2.4 GHz Band Edges)

Specifications:

FCC Specification: Paragraph: 15.247 (d) IC Specification: N/A

The *Radiated Emissions in Restricted Band* – Band Edge measurements were performed at the following test location:

I - Test not applicable

- □ Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- □ Oakwood Lab (Open Area Test Site)
- □ Wild River Lab Screen Room

Test equipment used :

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3367	E4440A	Agilent	Spectrum Analyzer	MY43362222	25-Aug-05
Cal Code E	B = Calibration verification	tion performed internally.	Cal Code Y = Calibration not required w	hen used with other calibra	ated equipment.

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.



FCC



FCC



AC Line Conducted Emissions

Specifications: CISPR 22

The AC Line Conducted Emission measurements were performed at the following test location:

- Test not applicable

- □ Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- □ Oakwood Lab (Open Area Test Site)
- □ Wild River Lab Screen Room

Test equipment used :

TUV ID	Model Numbe	er Manufacturer	Description	Serial Numbe	r Cal Due
3990	3816/2	ETS Lindgren	50 Ω LISN	00035359	Code B
					27-May-05
3800	ESCS 30	Rhode & Schwarz	EMI Receiver	100312	18-Jan-06
Cal Code	B = Calibration verif	fication performed internally.	Cal Code Y = Calibration not req	uired when used with oth	er calibrated equipment

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.



Test Report	#: WC50042	23 Run 3	Test Area:	STS		America
EUT Model	#: WiSP		Date:	2/3/2005		
EUT Serial	#: <u>N/A</u>		EUT Power:	60/50Hz/110/230VAC	Temperature	: <u>10.0</u> °C
Test Metho	d: EN55022	B / FCC B			Air Pressure:	: <u>98.0</u> kPa
Custome	er: DIGI INT	L			Rel. Humidity:	35.0 %
EUT Descriptio	n: <u>802.11b</u>	TO SERIAL CONVERTER M				
Note	s:					
Data File Nam	e: 0423.dat				Pa	age: 1 of 6
List of mea	asureme	nts for run #: 3				
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP ATTEN (dB)	? / FINAL (dBuV / r	EUT Lead	DELTA1 EN55022 B Qp	DELTA2 EN55022 B Avg
60Hz/110VAC			1	1		Ŭ
228.125 kHz	39.43 Qp	0.0 / 0.04 / 0.0 / 0.0	39.47	L1	-23.05	n/a
267.188 kHz	49.36 Qp	0.0 / 0.04 / 0.0 / 0.0	49.4	L1	-11.8	n/a
294.531 kHz	48.98 Qp	0.0 / 0.04 / 0.0 / 0.0	49.02	L1	-11.38	n/a
3.177 MHz	39.58 Qp	0.1 / 0.07 / 0.0 / 0.0	39.75	L1	-16.25	n/a
3.474 MHz	38.03 Qp	0.1 / 0.07 / 0.0 / 0.0	38.2	L1	-17.8	n/a
3.771 MHz	35.41 Qp	0.1 / 0.08 / 0.0 / 0.0	35.59	L1	-20.41	n/a
228.125 kHz	18.76 Av	0.0/0.04/0.0/0.0	18.8	L1	n/a	-33.72
267.188 kHz	37.42 Av	0.0/0.04/0.0/0.0	37.46	L1	n/a	-13.74
294.531 kHz	37.59 Av	0.0/0.04/0.0/0.0	37.63	L1	n/a	-12.77
3.177 MHz	32.7 Av	0.1 / 0.07 / 0.0 / 0.0	32.87	L1	n/a	-13.13
3.474 MHz	30.54 Av	0.1 / 0.07 / 0.0 / 0.0	30.71	L1	n/a	-15.29
3.771 MHz	29.44 Av	0.1 / 0.08 / 0.0 / 0.0	29.62	L1	n/a	-16.38
228.125 kHz	49.98 Qp	0.0 / 0.04 / 0.0 / 0.0	50.02	N	-12.5	n/a
267.188 kHz	48.29 Qp	0.0 / 0.04 / 0.0 / 0.0	48.33	N	-12.87	n/a
294.531 kHz	46.29 Qp	0.0 / 0.04 / 0.0 / 0.0	46.33	N	-14.07	n/a
3.177 MHz	43.29 Qp	0.1 / 0.07 / 0.0 / 0.0	43.46	N	-12.54	n/a
3.474 MHz	42.76 Qp	0.1 / 0.07 / 0.0 / 0.0	42.93	N	-13.07	n/a
3.771 MHz	41.52 Qp	0.1 / 0.08 / 0.0 / 0.0	41.7	N	-14.3	n/a
				1		
228.125 kHz	20.9 Av	0.0 / 0.04 / 0.0 / 0.0	20.94	N	n/a	-31.58
267.188 kHz	40.3 Av	0.0 / 0.04 / 0.0 / 0.0	40.34	N	n/a	-10.86
294.531 kHz	39.96 Av	0.0 / 0.04 / 0.0 / 0.0	40.0	N	n/a	-10.4
3.177 MHz	35.66 Av	0.1 / 0.07 / 0.0 / 0.0	35.83	N	n/a	-10.17

Tested by:

RMJ

Rent M. James

Signature

Reviewed by:

TKS

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Thomas K. Swamon



Test Report #	#: WC50042	23 Run 3	Test Area:	STS		, monou
EUT Model #	#: WiSP		Date:	2/3/2005		
EUT Serial #	#: <u>N/A</u>		EUT Power:	60/50Hz/110/230VAC	Temperature	: <u>10.0</u> °C
Test Method	d: EN55022	B / FCC B			Air Pressure	: <u>98.0</u> kPa
Custome	r: DIGI INT	L			Rel. Humidity	35.0 %
EUT Descriptior	n: <u>802.11b</u>	TO SERIAL CONVERTER M	IODULE			
Notes	s:					
Data File Name	e: 0423.dat				Pa	age: 2 of 6
List of mea	asureme	nts for run #: 3				
FREQ	LEVEL	CABLE / ANT / PREAMP	P/ FINAL	EUT Lead	DELTA1	DELTA2
	(dBuV)	ATTEN (dB)	(dBuV / r	n)	EN55022 B Qp	EN55022 B Avg
3.474 MHz	35.4 Av	0.1 / 0.07 / 0.0 / 0.0	35.57	N	n/a	-10.43
3.771 MHz	34.68 Av	0.1 / 0.08 / 0.0 / 0.0	34.86	N	n/a	-11.14
50Hz/230VAC						
150.0 kHz	53,16 Qp	0.0/0.05/0.0/0.0	53.21	N	-12.79	n/a
173.438 kHz	52.03 Qp	0.0 / 0.05 / 0.0 / 0.0	52.08	N	-12.72	n/a
200.781 kHz	50.55 Qp	0.0 / 0.04 / 0.0 / 0.0	50.59	N	-12.99	n/a
298.438 kHz	47.24 Qp	0.0 / 0.04 / 0.0 / 0.0	47.28	N	-13.01	n/a
3.06 MHz	38.73 Qp	0.1 / 0.07 / 0.0 / 0.0	38.9	N	-17.1	n/a
3.623 MHz	33.46 Qp	0.1/0.08/0.0/0.0	33.64	N	-22.36	n/a
0.020						
150.0 kHz	38.5 Av	0.0/0.05/0.0/0.0	38.55	N	n/a	-17.45
173,438 kHz	33.67 Av	0.0/0.05/0.0/0.0	33.72	N	n/a	-21.08
200 781 kHz	25.87 Av		25.91	N	n/a	-27.67
298 438 kHz	41 82 Av		41.86	N	n/a	-8 43
3.06 MHz	32 17 Av		32.34	N	n/a	-13 66
3 623 MHz	27 0 Av		27.18	N	n/a	-18.82
0.020 11112	21.07.0		21110		1.70	10.02
150.0 kHz	53 7 Qn	00/005/00/00	53 75	1	-12 25	n/a
173,438 kHz	52.01 Qn	0.0/0.05/0.0/0.0	52.06	 11	-12 74	n/a
200 781 kHz	50 55 On	00/004/00/00	50.59		-12 99	n/a
298 438 kHz	46.84 On	00/004/00/00	46.88		-13.41	n/a
3 06 MHz	37.86 On		38.02	<u> </u>	_17.07	n/a
3 623 MH-7	30.7 On	01/008/00/00	30.03	LI I 1	_25.12	n/a
5.025 IVII IZ	30.7 QP	0.170.0070.070.0	50.00		-20.12	11/a
150 0 kHz	38 66 41	00/005/00/00	38 71	11	n/a	-17 20
100.0 KHZ	50.00 AV	0.070.0070.070.0	50.71	L I	11/4	-11.23

Tested by:

RMJ

Rent M. James

Signature

Reviewed by:

TKS

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Thomas K. Swamon



Test Report	#: WC50042	23 Run 3	Test Area:	STS				
EUT Model	#: WiSP		Date:	2/3/2005				
EUT Serial	#: <u>N/A</u>		EUT Power:	60/50Hz/110/230VAC	Temperat	ture:	10.0	°C
Test Metho	d: EN55022	EN55022 B / FCC B Air Pre				sure:	98.0	kPa
Custome	er: DIGI INT'	L			Rel. Humi	dity:	35.0	%
EUT Descriptio	n: <u>802.11b</u>	TO SERIAL CONVERTER M	IODULE					
Note	es:							
Data File Nam	e: 0423.dat					Page:	3 of	6
List of me	asureme	nts for run #: 3						
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP ATTEN (dB)	/ FINAL (dBuV / i	EUT Lead	DELTA1 EN55022 B (Qp E	DELT N5502 Avg	A2 22 B
173.438 kHz	33.63 Av	0.0 / 0.05 / 0.0 / 0.0	33.68	L1	n/a		-21.1	2
200.781 kHz	25.64 Av	0.0 / 0.04 / 0.0 / 0.0	25.68	L1	n/a		-27.9	9
298.438 kHz	41.97 Av	0.0 / 0.04 / 0.0 / 0.0	42.01	L1	n/a		-8.28	3
3.06 MHz	30.5 Av	0.1 / 0.07 / 0.0 / 0.0	30.67	L1	n/a		-15.3	3
3.623 MHz	23.07 Av	0.1 / 0.08 / 0.0 / 0.0	23.25	L1	n/a		-22.7	5
END OF SCAN.								

Tested by:

Reviewed

by:

RMJ

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TKS

Pau M. John

Signature

Thomas K. Swamon



Test Report #:	WC500423 Run 3	Test Area:	STS	_		monou	
EUT Model #:	WiSP	Date:	2/3/2005	_			
EUT Serial #:	N/A	EUT Power:	60/50Hz/110/230VAC	Temperat	ure:	10.0	°C
Test Method:	EN55022 B / FCC B			Air Press	sure:	98.0	kPa
Customer:	DIGI INT'L			Rel. Humi	dity:	35.0	%
EUT Description:	802.11b TO SERIAL CONVERTER M	IODULE					
Notes:						1	
Data File Name:	0423.dat				Page:	4 of	6

Measurement summary for limit1: EN55022 B Qp (Qp)							
FREQ	LEVEL	CABLE / ANT / PREAMP /	FINAL	EUT Lead	DELTA1		
	(dBuV)	ATTEN	(dBuV / m)		EN55022 B Qp		
		(dB)					
294.531 kHz	48.98 Qp	0.0 / 0.04 / 0.0 / 0.0	49.02	L1	-11.38		
267.188 kHz	49.36 Qp	0.0 / 0.04 / 0.0 / 0.0	49.4	L1	-11.8		
150.0 kHz	53.7 Qp	0.0 / 0.05 / 0.0 / 0.0	53.75	L1	-12.25		
228.125 kHz	49.98 Qp	0.0 / 0.04 / 0.0 / 0.0	50.02	N	-12.5		
3.177 MHz	43.29 Qp	0.1 / 0.07 / 0.0 / 0.0	43.46	N	-12.54		
173.438 kHz	52.03 Qp	0.0 / 0.05 / 0.0 / 0.0	52.08	N	-12.72		
200.781 kHz	50.55 Qp	0.0 / 0.04 / 0.0 / 0.0	50.59	N	-12.99		
3.474 MHz	42.76 Qp	0.1 / 0.07 / 0.0 / 0.0	42.93	N	-13.07		
3.771 MHz	41.52 Qp	0.1 / 0.08 / 0.0 / 0.0	41.7	N	-14.3		
3.06 MHz	38.73 Qp	0.1 / 0.07 / 0.0 / 0.0	38.9	N	-17.1		
3.623 MHz	33.46 Qp	0.1 / 0.08 / 0.0 / 0.0	33.64	N	-22.36		

Tested by:

RMJ

Printed

Rue M. Johnson Signature

Thomas K. Swamon

Signature

Reviewed by:

Printed

TKS



Test Report #:	WC500423 Run 3	Test Area:	STS			linonou	
EUT Model #:	WiSP	Date:	2/3/2005				
EUT Serial #:	N/A	EUT Power:	60/50Hz/110/230VAC	Tempera	ture:	10.0	°C
Test Method:	EN55022 B / FCC B			Air Press	sure:	98.0	kPa
Customer:	DIGI INT'L			Rel. Humi	idity:	35.0	%
EUT Description:	802.11b TO SERIAL CONVERTER M	IODULE					
Notes:							
Data File Name:	0423.dat				Page:	5 of	6

Measurement summary for limit2: EN55022 B Avg (Av)							
FREQ	LEVEL	CABLE / ANT / PREAMP /	FINAL	EUT Lead	DELTA2		
	(dBuV)	ATTEN	(dBuV / m)		EN55022 B		
		(dB)			Avg		
298.438 kHz	41.97 Av	0.0 / 0.04 / 0.0 / 0.0	42.01	L1	-8.28		
3.177 MHz	35.66 Av	0.1 / 0.07 / 0.0 / 0.0	35.83	Ν	-10.17		
3.474 MHz	35.4 Av	0.1 / 0.07 / 0.0 / 0.0	35.57	Ν	-10.43		
267.188 kHz	40.3 Av	0.0 / 0.04 / 0.0 / 0.0	40.34	Ν	-10.86		
3.771 MHz	34.68 Av	0.1 / 0.08 / 0.0 / 0.0	34.86	Ν	-11.14		
3.06 MHz	32.17 Av	0.1 / 0.07 / 0.0 / 0.0	32.34	Ν	-13.66		
150.0 kHz	38.66 Av	0.0 / 0.05 / 0.0 / 0.0	38.71	L1	-17.29		
3.623 MHz	27.0 Av	0.1 / 0.08 / 0.0 / 0.0	27.18	Ν	-18.82		
173.438 kHz	33.67 Av	0.0 / 0.05 / 0.0 / 0.0	33.72	Ν	-21.08		
200.781 kHz	25.87 Av	0.0 / 0.04 / 0.0 / 0.0	25.91	N	-27.67		
228.125 kHz	20.9 Av	0.0 / 0.04 / 0.0 / 0.0	20.94	Ν	-31.58		

Tested by:

RMJ

Pau M. John

Signature

Reviewed by: TKS

Printed

Printed

Thomas K. Swamon



Test Report #:	WC500423 Run 3	Test Area:	STS			inonou	
EUT Model #:	WiSP	Date:	2/3/2005				
EUT Serial #:	N/A	EUT Power:	60/50Hz/110/230VAC	Tempera	ture:	10.0	°C
Test Method:	EN55022 B / FCC B			Air Press	sure:	98.0	kPa
Customer:	DIGI INT'L			Rel. Humi	dity:	35.0	%
EUT Description:	802.11b TO SERIAL CONVERTER M	IODULE					
Notes:							
Data File Name:	0423.dat				Page:	6 of	6

Graph:



Tested by:	RMJ	Par M. John
	Printed	Signature
Reviewed	TKS	Thomas K. Swamon
	Printed	Signature



Receiver Spurious Radiated Emissions

Specifications:

FCC Specification: Paragraph: 15.109

The Receiver Spurious Emission measurements were performed at the following test location:

- Test not applicable

- □ Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- I Oakwood Lab (Open Area Test Site)
- I Wild River Lab Screen Room

Test equipment used :

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3203	EM-6917B	Electro-Metrics	Biconicalog Periodic	106	30-Mar-05
2680	85650A	Hewlett-Packard	Quasi-Peak Adapter (Unit B)	2043A00343	10-May-05
3809	8566B	Hewlett-Packard	Spectrum Analyzer	3026A19165	20-Mar-05
3810	85662A	Hewlett-Packard	Analyzer Display	3014A06698	20-Mar-05
2665	ZHL-1042J	Mini-Circuits	Preamplifier	32296	Code B 08-Feb-05
2075	3115	Electro-Mechanics (EMCO)	Ridge Guide Ant. 1-18 GHz	9001-3275	24-Nov-05
2478	AWT-18037	Avantek	Preamplifier 8-18 GHz	1001-9226	Code B 24-May-05
2127	11975A	Hewlett Packard	Amplifier 2- 8 GHz	2738A01200	Code Á 25-May-05
2662 2788	11970K 3116	Hewlett-Packard Electro-Mechanics	Harm Mixer – 18-26.5 GHz Ridge Guide Ant 18-40 GHz	2332A01170 2005	11-Jul-06 27-Sep-05
		(EIVICO)			

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

RADIATED EMISSIONS



Test Report #	WC50042	23 Run 2	Test Area:	STS				
EUT Model #	WiSP		Date:	2/3/2005				
EUT Serial #	: <u>N/A</u>		EUT Power:	60Hz/110VAC	Temperat	ture:	10.0	°C
Test Method	EN 55022	2			Air Press	sure:	98.0	kPa
Customer	DIGI INT	L			Rel. Humi	dity:	35.0	%
EUT Description	: 802.11b	TO SERIAL CONVERTER M	IODULE					
Notes	RCVR SF	PURIOUS SCAN						
Data File Name	: 0423-2.da	at				Page:	1 of	1
List of mea	sureme	nts for run #: 2						
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP ATTEN (dB)	P / FINAL (dBuV / I	m) POL / HGT / AZ (m)(DEG)	DELTA1	DELTA2		A2
NO SPURIOUS EI	VISSIONS F	OUND ON LOW OR HIGH C	CHANNEL W/ V	OR H POLARIZATION	S AT ALL AZIM	UTHS 1	-4 MTF	RS.
END OF SCAN 30	MHz - 12 75	5GHz						

Tested by:	
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Reviewed

by:

RMJ

Rue M. Johnson Signature

Printed

TKS

Printed

Thomas K. Swamon