TEST RESULT SUMMARY

FCC Part 15 Subpart C Section 15.247
Industry Canada RSS-210 Issue 7

MANUFACTURER'S NAME	Digi International
NAME OF EQUIPMENT	Digi Connect Wi-ME
MODEL NUMBER(S) TESTED	50000880-08
MANUFACTURER'S ADDRESS	11001 Bren Road East Minnetonka MN 55343
TEST REPORT NUMBER	WC900432
TEST DATE(S)	28-30 January 2009

TÜV SÜD America Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the applicable requirements of FCC Part 15, Subpart C, Section 15.247 *"Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz"* and Industry Canada RSS-210 Issue 7 *"Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment".*

This is a retest of the spurious radiated emission requirements to demonstrate compliance of a 10 dBi gain antenna so that a Class II permissive change can be applied for.

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.

		Tested by:	Approved by:
Date:	10 February 2009		
Location:	Taylors Falls MN USA	Greg S Jakubowski Senior EMC Technician	Joel T Schneider Senior EMC Engineer

Not Transferable

EMC TEST REPORT

Test Report No.	**WC900432**	Date of issue:	10 February 2009
Model / Serial No(s) Tested	50000880-08 / ---		
Product Type	Digi Connect Wi-ME 802.11b radio to serial converter module		
Manufacturer	Digi International		
Address	11001 Bren Road East		
	Minnetonka MN 55343		
Test Result	■ **Positive** ☐ **Negative**		
Total pages including Appendices	**36**		

TÜV SÜD America Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV SÜD America Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD America Inc issued reports.

TÜV SÜD America Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NARTE, and VCCI.

REVISION RECORD

REVISION	TOTAL NUMBER OF PAGES	DATE	DESCRIPTION
	36	10 February 2009	

TEST REPORT CONTENTS **Page(s)**

EMC TEST REGULATIONS:

The tests were performed according to the following regulations:

- FCC Part 15 Subpart C Section 15.247 Paragraph (d)
- Industry Canada RSS-210 Issue 7 Section A8.5

ENVIRONMENTAL CONDITIONS IN THE LAB

	Actual
Temperature:	: 20-23° C
Atmospheric pressure	: 98 kPa
Relative Humidity	: 18-20%

POWER SUPPLY UTILIZED

Power supply system	: 3.3 Vdc

TEST EQUIPMENT

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.

SIGN EXPLANATIONS

☐ - not applicable
■ - applicable

6 dB Bandwidth
FCC 15.247(a)(2), IC RSS-210 A8.2(a)

Test summary
The requirements are: ☐ - MET ■ - NOT APPLICABLE
Testing was performed in accordance with the test procedure of FCC KDB Publication 558074

Test location
☐ - Wild River Lab Large Test Site (Open Area Test Site)
☐ - Wild River Lab Small Test Site (Open Area Test Site)
☐ - Wild River Lab Tech Area, conducted measurement

Test limit
500 kHz minimum

Test data

Maximum peak output power
FCC 15.247(b)(3), IC RSS-210 A8.4(4)

Test summary
The requirements are: ■ - MET ☐ - NOT MET
Testing was performed in accordance with the test procedure of FCC KDB Publication 558074

Maximum peak output power measured in grant for FCC ID: MCQ-50M880 is 24.14 dBm (conducted). Grant lists a 2 dBi gain antenna. The rules allow 1 watt peak output power, with up to a 6 dBi gain antenna, or 36 dBm ERP. Since 24.14 dBm output power of this device, + 10 dBi gain antenna, is less than 36 dBm ERP, no reduction in power is necessary in order to use the 10 dBi gain antenna.

Test location
☐ - Wild River Lab Large Test Site (Open Area Test Site)
☐ - Wild River Lab Small Test Site (Open Area Test Site)
☐ - Wild River Lab Tech Area, conducted measurement

Test limit
1 watt

Test data

Spurious emissions
FCC 15.247(d), IC RSS-210 A8.5

Test summary
The requirements are: ■ - MET ☐ - NOT MET
Testing was performed in accordance with ANSI C63.4 2003, clause 8.3 and FCC KDB Publication 558074.

Maximum radiated spurious emission is 53.53 dBµV/m with average detection (474.7 µV/m) at 3 meters at 4.924 GHz. Minimum margin of compliance = 0.47 dB – this is the same margin as measured for the existing grant, meeting requirements for a permissive change. Peak-average duty cycle correction was not used. Average radiated measurements above 1 GHz are achieved with spectrum analyzer settings of 1 MHz RBW / 10 Hz VBW

Test location
■ - Wild River Lab Large Test Site (Open Area Test Site)
☐ - Wild River Lab Small Test Site (Open Area Test Site)
☐ - Wild River Lab Tech Area, conducted measurement

Test equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Due
WRLE03371	E4440A	Agilent	Spectrum Analyzer	MY43362222	14-Nov-09
WRLE03978	SL26-3010	Phase One Microwave	Amplifier 18-26.5 GHz	0005	26-Mar-09
WRLE02684	85650A	Hewlett-Packard	Quasi-Peak Adapter	2521A01006	23-Apr-09
WRLE08052	8566B	Hewlett-Packard	Spectrum Analyzer	2115A00853	27-Mar-09
WRLE02675	85662A	Hewlett-Packard	Analyzer Display	2542A11472	04-Aug-09
WRLE03847	ZHL-1042J	Mini-Circuits	Preamplifier 10 - 3000 MHz	0607	Code B
WRLE010527	SL18B4020	Phase One Microwave	Preamplifier 1 – 18 GHz	0001	Code B
WRLE03995	EM-6917B	Electro-Metrics	Biconicalog Periodic	151	23-Apr-09
WRLE02075	3115	EMCO	Ridge Guide Ant. 1-18 GHz	9001-3275	13-Jan-10
WRLE03997	EWT-14-0066	EWT	2.4 GHz Notch filter	E2	Code B
WRLE02003	F550B1	Acronetics	4 – 8 GHz Bandpass Filter	010	Code B
WRLE03933	F551B-1	Acronetics	8 – 12 GHz Bandpass Filter	010	Code B
WRLE03934	F549B-1	Acronetics	2 – 4 GHz Bandpass Filter	010	Code B
WRLE03935	F548B-1	Acronetics	1 – 2 GHz Bandpass Filter	010	Code B

Cal Code B = Calibration verification performed internally.

Test limit - conducted
-20 dBc

Test limit within restricted bands per 15.205 - radiated

Frequncy (MHz)	Field strength (µV/meter)	Field strength (dBµV/meter)
30 - 88	100, QP	40.0
88 - 216	150, QP	43.5
216 - 960	200, QP	46.0
Above 960	500, QP	54.0
> 1000	500, AV 5000, PK	54.0 74.0

Test data
See following pages

RADIATED EMISSIONS

Test Report #:	WC900432 Run 1	Test Area:	LTS		
EUT Model #:	50000880-08	Date:	1/28/2009		
EUT Serial #:		EUT Power:	3.3 VDC	Temperature:	23.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	18.0 %
EUT Description:	802.11b Wi-ME with 10dBi antenna				
Notes:	No duty cycle correction added to average measurements. 2nd harmonic average measurements could be reduced by 20 dB because of 10% duty cycle				
Data File Name:	0432.dat			Page:	1 of 5

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.247 (15.209) >1GHz 3m avg	DELTA2 FCC 15.247 (15.209) >1G 3m pk
Power setting 15, 11 MB data rate						
Maximized fundamental for bandedge compliance plots						
Ch 1, 355 deg az, Measurement antenna 1.24m high, Vertical						
Ch 11, 131 deg az, Measurement antenna 1.31m high, Vertical						
Begin spurious emissions scan from 1 to 18 GHz						
Channel 1						
1.161 GHz	54.48 Av	2.93 / 25.37 / 41.49 / 0.06	41.35	V / 1.00 / 0	-12.65	n/a
1.161 GHz	56.95 Pk	2.93 / 25.37 / 41.49 / 0.06	43.82	V / 1.00 / 0	n/a	-30.18
1.708 GHz	49.48 Av	3.33 / 26.14 / 42.65 / 0.08	36.39	H / 1.00 / 29	-17.61	n/a
1.708 GHz	55.2 Pk	3.33 / 26.14 / 42.65 / 0.08	42.11	V / 1.00 / 0	n/a	-31.89
2.104 GHz	52.49 Av	3.95 / 27.84 / 43.47 / 0.13	40.93	V / 1.00 / 0	-13.07	n/a
2.104 GHz	58.3 Pk	3.95 / 27.84 / 43.47 / 0.13	46.74	V / 1.00 / 0	n/a	-27.26
2.324 GHz	55.82 Av	4.25 / 28.36 / 43.77 / 0.48	45.14	V / 1.00 / 0	-8.86	n/a
2.324 GHz	61.75 Pk	4.25 / 28.36 / 43.77 / 0.48	51.07	V / 1.00 / 0	n/a	-22.93
2.632 GHz	55.85 Av	4.68 / 29.09 / 43.98 / 0.29	45.93	V / 1.00 / 0	-8.07	n/a
2.632 GHz	61.95 Pk	4.68 / 29.09 / 43.98 / 0.29	52.03	V / 1.00 / 0	n/a	-21.97
4.824 GHz	48.73 Av	6.71 / 32.81 / 43.57 / 0.0	44.68	V / 1.00 / 0	-9.32	n/a
4.824 GHz	58.0 Pk	6.71 / 32.81 / 43.57 / 0.0	53.95	V / 1.00 / 0	n/a	-20.05
Rotated 360 degrees, both polarities, max hold 1-2 GHz						
Maximized						
1.161 GHz	57.96 Av	2.93 / 25.37 / 41.49 / 0.06	44.83	H / 1.00 / 330	-9.17	n/a
1.161 GHz	60.0 Pk	2.93 / 25.37 / 41.49 / 0.06	46.87	H / 1.00 / 330	n/a	-27.13
1.051 GHz	55.96 Av	2.91 / 25.46 / 40.4 / 0.05	43.98	H / 1.00 / 29	-10.02	n/a
1.051 GHz	57.2 Pk	2.91 / 25.46 / 40.4 / 0.05	45.22	H / 1.00 / 29	n/a	-28.78

Tested by: Greg Jakubowski (Printed) — G Jakubowski (Signature)

Reviewed by: Joel T Schneider (Printed) — Joel T. Schneider (Signature)

RADIATED EMISSIONS

Test Report #:	WC900432 Run 1	Test Area:	LTS		
EUT Model #:	50000880-08	Date:	1/28/2009		
EUT Serial #:		EUT Power:	3.3 VDC	Temperature:	23.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	18.0 %
EUT Description:	802.11b Wi-ME with 10dBi antenna				
Notes:	No duty cycle correction added to average measurements. 2nd harmonic average measurements could be reduced by 20 dB because of 10% duty cycle				
Data File Name:	0432.dat			Page:	2 of 5

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.247 (15.209) >1GHz 3m avg	DELTA2 FCC 15.247 (15.209) >1G 3m pk
Rotated 360 degrees, both polarities, max hold 2-4 GHz						
2.28 GHz	59.45 Av	4.19 / 28.26 / 43.94 / 0.41	48.37	V / 1.00 / 344	-5.63	n/a
2.28 GHz	65.45 Pk	4.19 / 28.26 / 43.94 / 0.41	54.37	V / 1.00 / 344	n/a	-19.63
4-6 GHz						
maximized						
4.824 GHz	54.69 Av	6.71 / 32.81 / 43.57 / 0.0	50.64	V / 1.05 / 330	-3.36	n/a
4.824 GHz	66.0 Pk	6.71 / 32.81 / 43.57 / 0.0	61.95	V / 1.05 / 330	n/a	-12.05
No significant emissions detected 6-18 GHz						
Ch 6						
maximized new or higher emissions						
4.874 GHz	53.96 Av	6.76 / 32.92 / 43.61 / 0.0	50.03	V / 1.15 / 87	-3.97	n/a
4.874 GHz	63.85 Pk	6.76 / 32.92 / 43.61 / 0.0	59.92	V / 1.15 / 87	n/a	-14.08
Ch 11						
maximized new or higher emissions						
4.924 GHz	57.32 Av	6.82 / 33.03 / 43.64 / 0.0	53.53	V / 1.15 / 335	-0.47	n/a
4.924 GHz	67.7 Pk	6.82 / 33.03 / 43.64 / 0.0	63.91	V / 1.15 / 335	n/a	-10.09
Begin scan 18 - 25 GHz						
No significant emissions detected						
End scan 1 - 25 GHz						

Tested by: Greg Jakubowski (Printed) — G Jakubowski (Signature)

Reviewed by: Joel T Schneider (Printed) — Joel T. Schneider (Signature)

RADIATED EMISSIONS

Test Report #:	WC900432 Run 1	Test Area:	LTS		
EUT Model #:	50000880-08	Date:	1/28/2009		
EUT Serial #:		EUT Power:	3.3 VDC	Temperature:	23.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	18.0 %
EUT Description:	802.11b Wi-ME with 10dBi antenna				
Notes:	No duty cycle correction added to average measurements. 2nd harmonic average measurements could be reduced by 20 dB because of 10% duty cycle				
Data File Name:	0432.dat			Page:	3 of 5

Measurement summary for limit1: FCC 15.247 (15.209) >1GHz 3m avg (Av)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.247 (15.209) >1GHz 3m avg
4.924 GHz	57.32 Av	6.82 / 33.03 / 43.64 / 0.0	53.53	V / 1.15 / 335	-0.47
4.824 GHz	54.69 Av	6.71 / 32.81 / 43.57 / 0.0	50.64	V / 1.05 / 330	-3.36
4.874 GHz	53.96 Av	6.76 / 32.92 / 43.61 / 0.0	50.03	V / 1.15 / 87	-3.97
2.28 GHz	59.45 Av	4.19 / 28.26 / 43.94 / 0.41	48.37	V / 1.00 / 344	-5.63
2.632 GHz	55.85 Av	4.68 / 29.09 / 43.98 / 0.29	45.93	V / 1.00 / 0	-8.07
2.324 GHz	55.82 Av	4.25 / 28.36 / 43.77 / 0.48	45.14	V / 1.00 / 0	-8.86
1.161 GHz	57.96 Av	2.93 / 25.37 / 41.49 / 0.06	44.83	H / 1.00 / 330	-9.17
1.051 GHz	55.96 Av	2.91 / 25.46 / 40.4 / 0.05	43.98	H / 1.00 / 29	-10.02
2.104 GHz	52.49 Av	3.95 / 27.84 / 43.47 / 0.13	40.93	V / 1.00 / 0	-13.07
1.708 GHz	49.48 Av	3.33 / 26.14 / 42.65 / 0.08	36.39	H / 1.00 / 29	-17.61

Tested by: Greg Jakubowski (Printed) _____ (Signature)

Reviewed by: Joel T Schneider (Printed) _____ (Signature)

RADIATED EMISSIONS

Test Report #:	WC900432 Run 1	Test Area:	LTS			
EUT Model #:	50000880-08	Date:	1/28/2009			
EUT Serial #:		EUT Power:	3.3 VDC	Temperature:	23.0	°C
Test Method:	FCC 15.247			Air Pressure:	98.0	kPa
Customer:	Digi			Rel. Humidity:	18.0	%
EUT Description:	802.11b Wi-ME with 10dBi antenna					
Notes:	No duty cycle correction added to average measurements. 2nd harmonic average measurements could be reduced by 20 dB because of 10% duty cycle					
Data File Name:	0432.dat			Page:	4 of 5	

Measurement summary for limit2: FCC 15.247 (15.209) >1G 3m pk (Pk)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA2 FCC 15.247 (15.209) >1G 3m pk
4.924 GHz	67.7 Pk	6.82 / 33.03 / 43.64 / 0.0	63.91	V / 1.15 / 335	-10.09
4.824 GHz	66.0 Pk	6.71 / 32.81 / 43.57 / 0.0	61.95	V / 1.05 / 330	-12.05
4.874 GHz	63.85 Pk	6.76 / 32.92 / 43.61 / 0.0	59.92	V / 1.15 / 87	-14.08
2.28 GHz	65.45 Pk	4.19 / 28.26 / 43.94 / 0.41	54.37	V / 1.00 / 344	-19.63
2.632 GHz	61.95 Pk	4.68 / 29.09 / 43.98 / 0.29	52.03	V / 1.00 / 0	-21.97
2.324 GHz	61.75 Pk	4.25 / 28.36 / 43.77 / 0.48	51.07	V / 1.00 / 0	-22.93
1.161 GHz	60.0 Pk	2.93 / 25.37 / 41.49 / 0.06	46.87	H / 1.00 / 330	-27.13
2.104 GHz	58.3 Pk	3.95 / 27.84 / 43.47 / 0.13	46.74	V / 1.00 / 0	-27.26
1.051 GHz	57.2 Pk	2.91 / 25.46 / 40.4 / 0.05	45.22	H / 1.00 / 29	-28.78
1.708 GHz	55.2 Pk	3.33 / 26.14 / 42.65 / 0.08	42.11	V / 1.00 / 0	-31.89

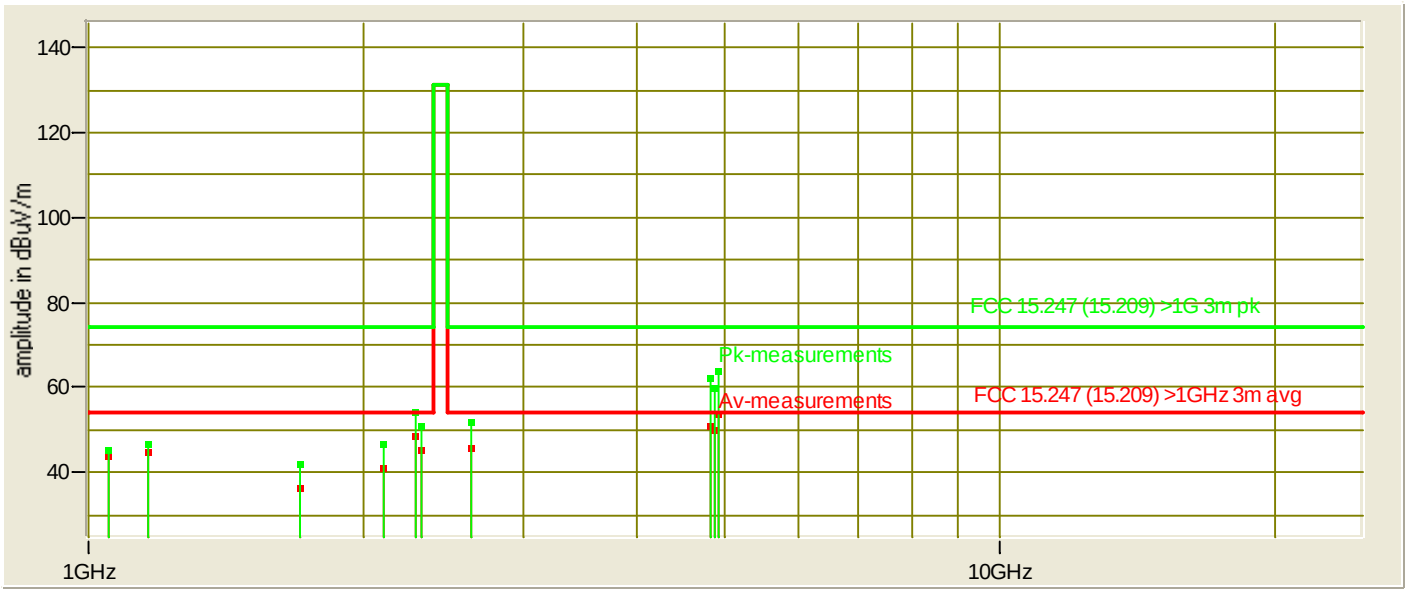
Tested by: Greg Jakubowski (Printed) — G Jakubowski (Signature)

Reviewed by: Joel T Schneider (Printed) — Joel T. Schneider (Signature)

RADIATED EMISSIONS

Test Report #:	WC900432 Run 1	Test Area:	LTS		
EUT Model #:	50000880-08	Date:	1/28/2009		
EUT Serial #:		EUT Power:	3.3 VDC	Temperature:	23.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	18.0 %
EUT Description:	802.11b Wi-ME with 10dBi antenna				
Notes:	No duty cycle correction added to average measurements. 2nd harmonic average measurements could be reduced by 20 dB because of 10% duty cycle				
Data File Name:	0432.dat			Page:	5 of 5

Graph:



Tested by: Greg Jakubowski (Printed) _____ (Signature)

Reviewed by: Joel T Schneider (Printed) _____ (Signature)

RADIATED EMISSIONS

Test Report #:	WC900432 Run 4	Test Area:	LTS		
EUT Model #:	50000880-08	Date:	1/30/2009		
EUT Serial #:		EUT Power:	3.3 VDC	Temperature:	20.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	20.0 %
EUT Description:	802.11b Wi-ME with 10dBi antenna				
Notes:	Power setting 15 - 11 Mb data rate Module case grounded to dev board				
Data File Name:	0432.dat			Page:	1 of 4

List of measurements for run #: 4

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.247 <1GHz 3m	DELTA2
Channel 1						
109.975 MHz	45.34 Qp	0.9 / 9.22 / 29.7 / 0.0	25.77	V / 1.00 / 0	-17.73	n/a
131.975 MHz	52.03 Qp	0.9 / 8.3 / 29.7 / 0.0	31.53	V / 1.00 / 0	-11.97	n/a
165.875 MHz	43.37 Qp	0.9 / 8.77 / 29.8 / 0.01	23.25	V / 1.00 / 0	-20.25	n/a
168.05 MHz	34.71 Qp	0.9 / 8.96 / 29.8 / 0.01	14.77	V / 1.00 / 0	-28.73	n/a
241.975 MHz	43.53 Qp	0.91 / 11.79 / 29.71 / 0.01	26.53	V / 1.00 / 0	-19.47	n/a
263.975 MHz	43.56 Qp	1.04 / 12.56 / 29.8 / 0.01	27.38	V / 1.00 / 0	-18.62	n/a
329.975 MHz	36.96 Qp	1.42 / 14.09 / 29.96 / 0.01	22.53	V / 1.00 / 0	-23.47	n/a
409.65 MHz	39.38 Qp	1.6 / 15.61 / 30.0 / 0.02	26.61	V / 1.00 / 0	-19.39	n/a
608.25 MHz	34.62 Qp	1.98 / 19.19 / 30.14 / 0.03	25.68	V / 1.00 / 0	-20.32	n/a
329.975 MHz	41.47 Qp	1.42 / 14.09 / 29.96 / 0.01	27.04	V / 1.00 / 90	-18.96	n/a
409.65 MHz	43.35 Qp	1.6 / 15.61 / 30.0 / 0.02	30.58	V / 1.00 / 180	-15.42	n/a
608.25 MHz	35.64 Qp	1.98 / 19.19 / 30.14 / 0.03	26.7	V / 1.00 / 180	-19.3	n/a
263.975 MHz	44.3 Qp	1.04 / 12.56 / 29.8 / 0.01	28.12	V / 1.00 / 270	-17.88	n/a
168.05 MHz	35.41 Qp	0.9 / 8.96 / 29.8 / 0.01	15.47	V / 3.00 / 0	-28.03	n/a
241.975 MHz	45.81 Qp	0.91 / 11.79 / 29.71 / 0.01	28.81	V / 3.00 / 0	-17.19	n/a
263.975 MHz	44.66 Qp	1.04 / 12.56 / 29.8 / 0.01	28.48	V / 3.00 / 0	-17.52	n/a
608.25 MHz	38.0 Qp	1.98 / 19.19 / 30.14 / 0.03	29.06	V / 3.00 / 0	-16.94	n/a
263.975 MHz	46.88 Qp	1.04 / 12.56 / 29.8 / 0.01	30.7	V / 3.00 / 90	-15.3	n/a
263.975 MHz	49.45 Qp	1.04 / 12.56 / 29.8 / 0.01	33.27	V / 2.40 / 60	-12.73	n/a
263.975 MHz	50.89 Qp	1.04 / 12.56 / 29.8 / 0.01	34.71	H / 1.00 / 0	-11.29	n/a
329.975 MHz	47.91 Qp	1.42 / 14.09 / 29.96 / 0.01	33.48	H / 1.00 / 0	-12.52	n/a
409.65 MHz	47.54 Qp	1.6 / 15.61 / 30.0 / 0.02	34.77	H / 1.00 / 0	-11.23	n/a
608.25 MHz	38.29 Qp	1.98 / 19.19 / 30.14 / 0.03	29.35	H / 1.00 / 0	-16.65	n/a
241.975 MHz	49.84 Qp	0.91 / 11.79 / 29.71 / 0.01	32.84	H / 1.00 / 90	-13.16	n/a
241.975 MHz	50.89 Qp	0.91 / 11.79 / 29.71 / 0.01	33.89	H / 1.00 / 180	-12.11	n/a
263.975 MHz	55.32 Qp	1.04 / 12.56 / 29.8 / 0.01	39.14	H / 1.00 / 180	-6.86	n/a
263.975 MHz	55.75 Qp	1.04 / 12.56 / 29.8 / 0.01	39.57	H / 1.10 / 160	-6.43	n/a

Tested by: J. T. Schneider (Printed) Joel T. Schneider (Signature)

Reviewed by: Greg S Jakubowski (Printed) G Jakubowski (Signature)

RADIATED EMISSIONS

Test Report #:	WC900432 Run 4	Test Area:	LTS		
EUT Model #:	50000880-08	Date:	1/30/2009		
EUT Serial #:		EUT Power:	3.3 VDC	Temperature:	20.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	20.0 %
EUT Description:	802.11b Wi-ME with 10dBi antenna				
Notes:	Power setting 15 - 11 Mb data rate Module case grounded to dev board				
Data File Name:	0432.dat			Page:	2 of 4

List of measurements for run #: 4

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.247 <1GHz 3m	DELTA2
165.875 MHz	44.18 Qp	0.9 / 8.77 / 29.8 / 0.01	24.06	H / 3.00 / 270	-19.44	n/a
165.875 MHz	46.9 Qp	0.9 / 8.77 / 29.8 / 0.01	26.78	H / 1.70 / 230	-16.72	n/a
scanned 30-1000 MHz restricted bands, 1-4 m, 360 degrees, V & H						
same levels for ch. 6						
same levels for ch. 11						

Tested by: J. T. Schneider (Printed) — Joel T. Schneider (Signature)

Reviewed by: Greg S Jakubowski (Printed) — G Jakubowski (Signature)

RADIATED EMISSIONS

Test Report #:	WC900432 Run 4	Test Area:	LTS		
EUT Model #:	50000880-08	Date:	1/30/2009		
EUT Serial #:		EUT Power:	3.3 VDC	Temperature:	20.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	20.0 %
EUT Description:	802.11b Wi-ME with 10dBi antenna				
Notes:	Power setting 15 - 11 Mb data rate Module case grounded to dev board				
Data File Name:	0432.dat			Page:	3 of 4

Measurement summary for limit1: FCC 15.247 <1GHz 3m (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.247 <1GHz 3m
263.975 MHz	55.75 Qp	1.04 / 12.56 / 29.8 / 0.01	39.57	H / 1.10 / 160	-6.43
409.65 MHz	47.54 Qp	1.6 / 15.61 / 30.0 / 0.02	34.77	H / 1.00 / 0	-11.23
131.975 MHz	52.03 Qp	0.9 / 8.3 / 29.7 / 0.0	31.53	V / 1.00 / 0	-11.97
241.975 MHz	50.89 Qp	0.91 / 11.79 / 29.71 / 0.01	33.89	H / 1.00 / 180	-12.11
329.975 MHz	47.91 Qp	1.42 / 14.09 / 29.96 / 0.01	33.48	H / 1.00 / 0	-12.52
608.25 MHz	38.29 Qp	1.98 / 19.19 / 30.14 / 0.03	29.35	H / 1.00 / 0	-16.65
165.875 MHz	46.9 Qp	0.9 / 8.77 / 29.8 / 0.01	26.78	H / 1.70 / 230	-16.72
109.975 MHz	45.34 Qp	0.9 / 9.22 / 29.7 / 0.0	25.77	V / 1.00 / 0	-17.73
168.05 MHz	35.41 Qp	0.9 / 8.96 / 29.8 / 0.01	15.47	V / 3.00 / 0	-28.03

Tested by: J. T. Schneider (Printed) Joel T. Schneider (Signature)

Reviewed by: Greg S Jakubowski (Printed) G Jakubowski (Signature)

RADIATED EMISSIONS

Test Report #:	WC900432 Run 4	Test Area:	LTS		
EUT Model #:	50000880-08	Date:	1/30/2009		
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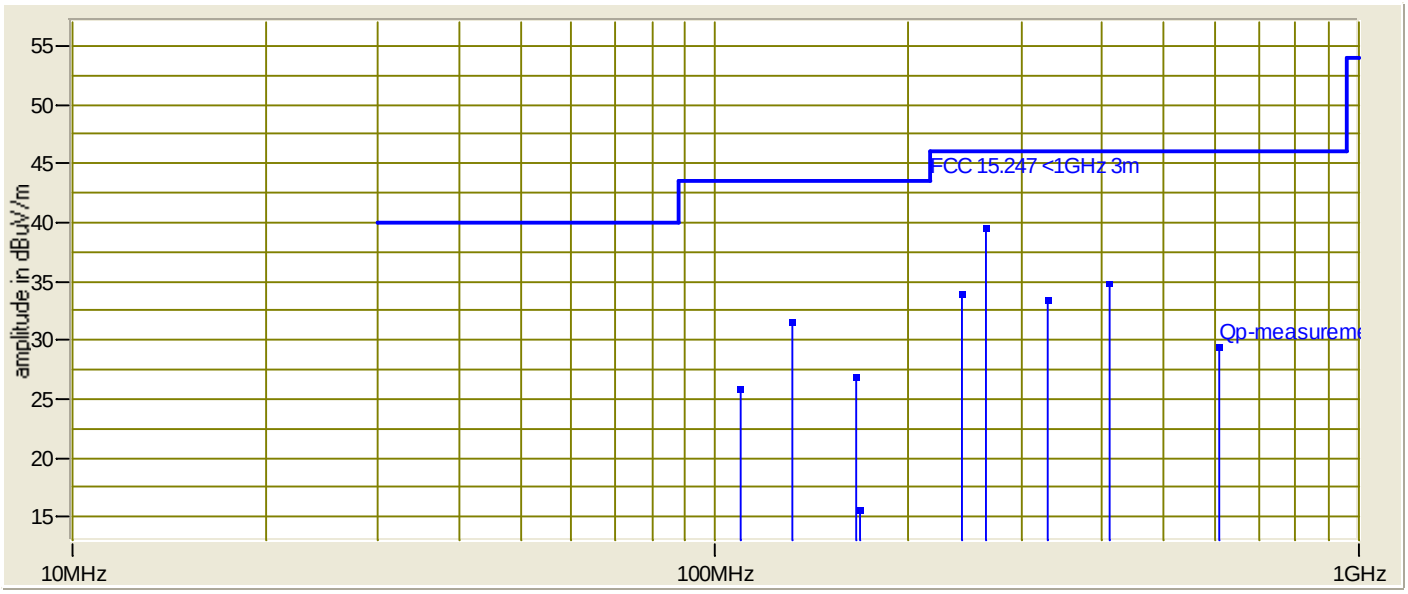
Notes:	Power setting 15 - 11 Mb data rate Module case grounded to dev board				
Data File Name:	0432.dat			Page:	4 of 4

Graph:



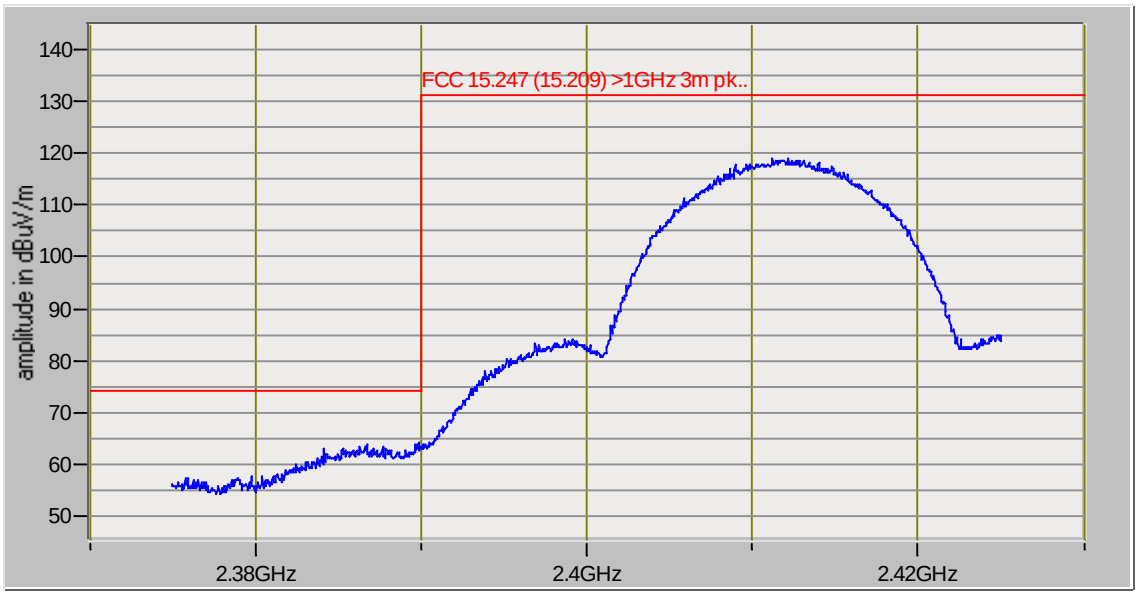
Tested by: J. T. Schneider (Printed) — Joel T. Schneider (Signature)

Reviewed by: Greg S Jakubowski (Printed) — G Jakubowski (Signature)

RADIATED BANDEDGE

Test Report #:	WC900432	Test Area:	LTS		
EUT Model #:	50000880-08	Date:	1/28/2009		
EUT Serial #:		EUT Power:	3.3 VDC	Temperature:	22.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	19.0 %
EUT Description:	802.11b Wi-ME with 10dBi antenna				
Notes:					
Data File Name:				Page:	1 of 4

Ch 1, 11 MB, power setting 15
Peak



RBW 1 MHz VBW 1MHz

Tested by: Greg Jakubowski — Printed

Signature

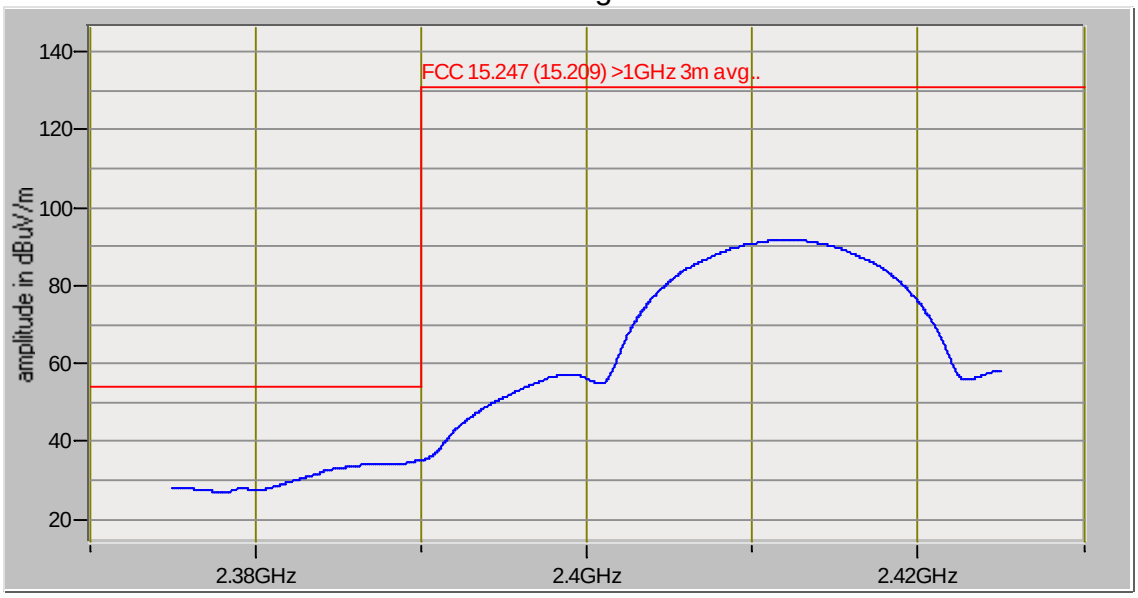
Reviewed by: Joel T Schneider — Printed

Signature

RADIATED BANDEDGE

Test Report #:	WC900432	Test Area:	LTS		
EUT Model #:	50000880-08	Date:	1/28/2009		
EUT Serial #:		EUT Power:	3.3 VDC	Temperature:	22.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	19.0 %
EUT Description:	802.11b Wi-ME with 10dBi antenna				
Notes:					
Data File Name:				Page:	2 of 4

Ch 1, 11 MB, power setting 15
Average



RBW 1 MHz VBW 10Hz

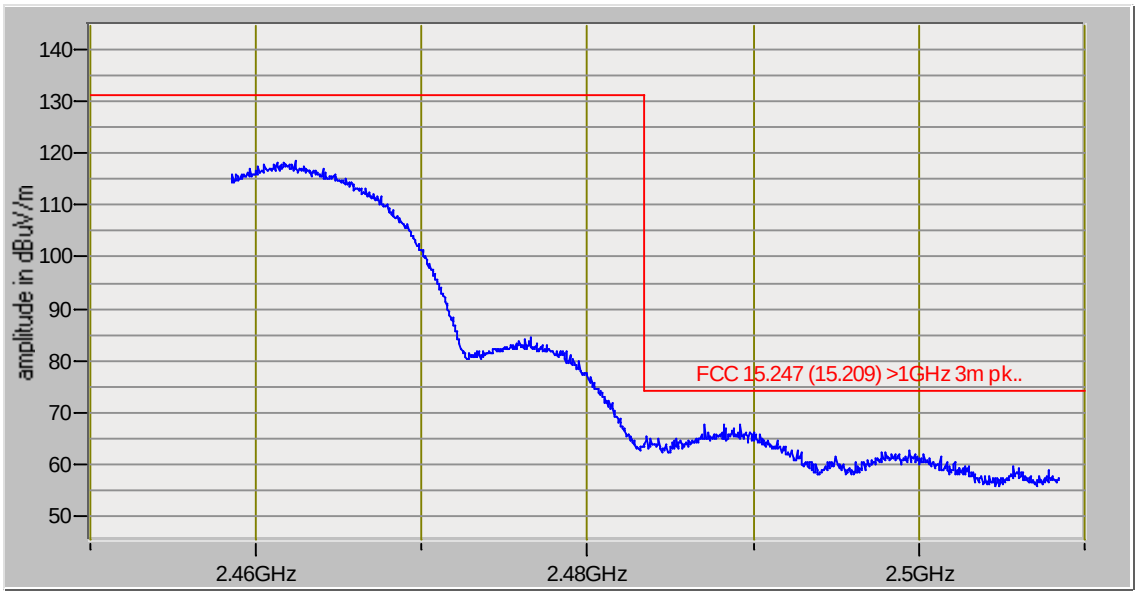
Tested by: Greg Jakubowski (Printed) — G Jakubowski (Signature)

Reviewed by: Joel T Schneider (Printed) — Joel T. Schneider (Signature)

RADIATED BANDEDGE

Test Report #:	WC900432	Test Area:	LTS		
EUT Model #:	50000880-08	Date:	1/28/2009		
EUT Serial #:		EUT Power:	3.3 VDC	Temperature:	22.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	19.0 %
EUT Description:	802.11b Wi-ME with 10dBi antenna				
Notes:					
Data File Name:				Page:	3 of 4

Ch 11, 11 MB, power setting 15
Peak



RBW 1 MHz VBW 1MHz

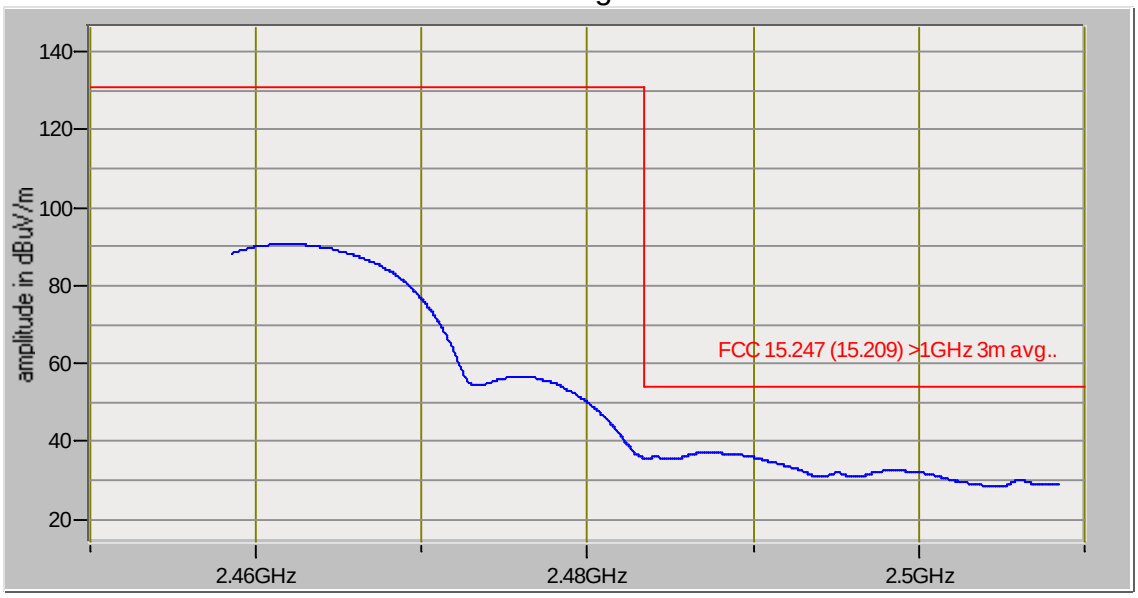
Tested by: Greg Jakubowski (Printed) _____ (Signature)

Reviewed by: Joel T Schneider (Printed) _____ (Signature)

RADIATED BANDEDGE

Test Report #:	WC900432	Test Area:	LTS		
EUT Model #:	50000880-08	Date:	1/28/2009		
EUT Serial #:		EUT Power:	3.3 VDC	Temperature:	22.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	19.0 %
EUT Description:	802.11b Wi-ME with 10dBi antenna				
Notes:					
Data File Name:				Page:	4 of 4

Ch 11, 11 MB, power setting 15
Average



RBW 1 MHz VBW 10Hz

Tested by: Greg Jakubowski (Printed) — G Jakubowski (Signature)

Reviewed by: Joel T Schneider (Printed) — Joel T. Schneider (Signature)

Power spectral density
FCC 15.247(e), IC RSS-210 A8.2(b)

Test summary
The requirements are: ☐ - MET ■ - NOT APPLICABLE
Test was performed in accordance with the test procedure of FCC KDB Publication 558074

Test location
☐ - Wild River Lab Large Test Site (Open Area Test Site)
☐ - Wild River Lab Small Test Site (Open Area Test Site)
☐ - Wild River Lab Tech Area, conducted measurement

Test limit
No greater than 8 dBm in any 3 kHz band

Test data

99% Bandwidth
IC RSS-GEN 4.6

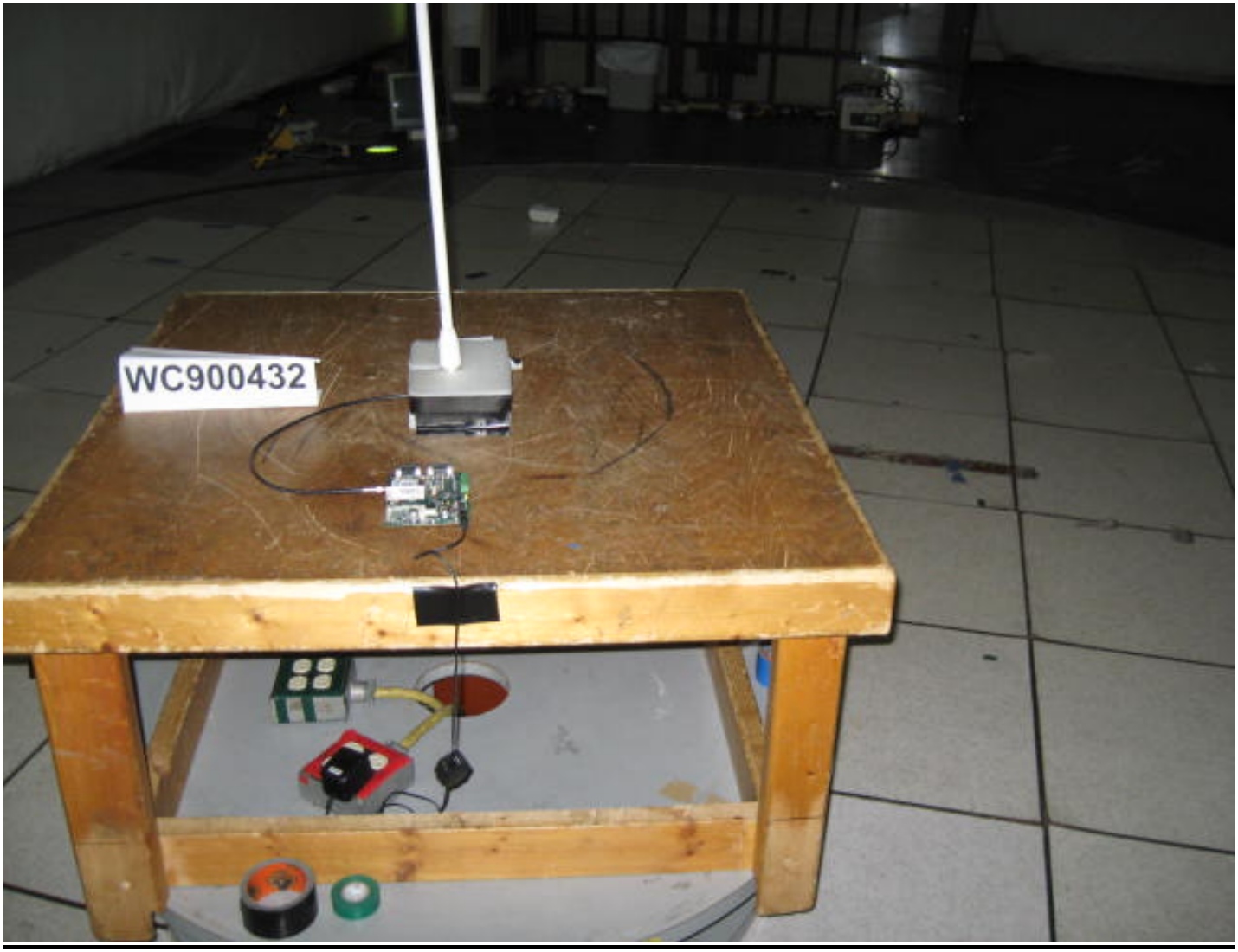
Test summary
The requirements are: ☐ - MET ■ - NOT APPLICABLE
Test was performed in accordance with the article “The Measurement of Occupied Bandwidth” by Industry Canada’s certification bureau

Test location
☐ - Wild River Lab Large Test Site (Open Area Test Site)
☐ - Wild River Lab Small Test Site (Open Area Test Site)
☐ - Wild River Lab Tech Area, conducted measurement

Test limit

Test data

Test-setup photo(s):
Radiated measurements



Equipment Under Test (EUT) Test Operation Mode:

The device under test was operated under the following conditions during emissions testing:

☐ - Standby

☐ - Test program (H - Pattern)

☐ - Test program (color bar)

☐ - Test program (customer specific)

☐ - Practice operation

☐ - Normal Operating Mode

■ - See Software and/or Operating Modes in Appendix A

Configuration of the device under test:

■ - See Constructional Data Form and Block Diagram in Appendix A

☐ - See Product Information Form in Appendix B

GENERAL REMARKS:

None

Modifications required to pass:

■ None
☐ As indicated on the data sheet(s)

Test Specification Deviations: Additions to or Exclusions from:

■ None
☐ As indicated in the Test Plan
☐

SUMMARY:

The requirements according to the technical regulations are
■ - met and the equipment under test does fulfill the general approval requirements.
☐ - **not** met and the equipment under test does **not** fulfill the general approval requirements.

EUT Received Date: 28 January 2009

Condition of EUT: Normal

Testing Start Date: 28 January 2009

Testing End Date: 30 January 2009

TÜV SÜD AMERICA INC

Tested by:

Greg S Jakubowski
Senior EMC Technician

Approved by:

Joel T Schneider
Senior EMC Engineer

Appendix A

Constructional Data Form

and

Block Diagram

Form

EMC Test Plan and Constructional Data Form

PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE. IF TESTING RESULTS IN MODIFICATIONS TO THE EQUIPMENT, PLEASE SUBMIT A REVISED TP/CDF INDICATING THOSE MODIFICATIONS.
NOTE: This information will be input into your test report as shown below. Press the F1 key at any time to get HELP for the current field selected.

Company:	Digi International Inc.		
Address:	11001 Bren Road East		
	Minnetonka, MN 55343		
	Ph: (952) 912-3200 Fax: (952) 912-4955		
Contact:	Slava Gekht	Position:	HW Engineer
Phone:	(952) 912-3245	Fax:	
E-mail Address:	slava.gekht@digi.com		

General Equipment Description -- ***NOTE: This information will be input into your test report as shown below.***

EUT Description	802.11b radio to serial converter module		
EUT Name	Digi Connect Wi-ME		
Model No.:	50000880-01through -99	Serial No.:	N/A
Product Options:			
Configurations to be tested:	50000880-08		

Equipment Modification (*If applicable, indicate modifications since EUT was last tested. If modifications are made during this testing, submit revised TP/CDF after testing is complete.)*

Modifications since last test:	Addinga 2.4Ghz 10dBi (MAXRAD MFB24010) OMNI antenna
Modifications made during test:	

Test Objective(s): ***Please indicate the tests to be performed, entering the applicable standard(s) where noted.***

- ☒ EMC Directive 2004/108/EC (EMC) — Std: ☒ FCC: Class ☐ A ☐ B Part C; ☒ VCCI: Class ☐ A ☐ B
- ☐ Machinery Directive 89/392/EEC (EMC) — Std: ☐ BSMI: Class ☐ A ☐ B (Separate Report); ☐ Canada: Class ☐ A ☐ B
- ☐ Medical Device Directive 93/42/EEC (EMC) — Std: ☒ Australia: Class ☐ A ☐ B; ☒ Other: FCC part C section 15.247
- ☐ Vehicle Directive: ☐ 2001/3/EC (EMC) ☐ 2004/104/EC (EMC) ☐ Other Vehicle Std:
- ☐ FDA Reviewers Guidance for Premarket Notification Submissions (EMC)

Third Party Certification, if applicable (*Signature on Page 6 Required)

- ☐ Attestation of Conformity (AoC)*
- ☐ Certificate of Conformity (CoC)*
- ☐ EMC Certification (used with Octagon Mark)*
- ☐ Compliance Document*
- Protection Class (N/A for vehicles) ☐ Class I ☐ Class II ☐ Class III
  (Press **F1** when field is selected to show additional information on Protection Class.)
- ☐ FCC / TCB Certification
- ☐ Industry Canada / FCB Certification
- ☐ E-Mark Certification
- ☐ Taiwan Certification

EMC Test Plan and Constructional Data Form

Attendance

Test will be: ☒ Attended by the customer ☐ Unattended by the customer

Failure - *Complete this section if testing will not be attended by the customer.*

If a failure occurs, TÜV SÜD America should:

☐ Call contact listed above, if not available then stop testing. (After hrs phone): _____

☐ Continue testing to complete test series.

☐ Continue testing to define corrective action.

☐ Stop testing.

EUT Specifications and Requirements

Length: 1.845" Width: 0.75" Height: 0.735" Weight: _____

Power Requirements

Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)

Voltage: 3.3VDC (If battery powered, make sure battery life is sufficient to complete testing.)

# of Phases: 1

Current (Amps/phase(max)): 300mA Current (Amps/phase(nominal)): 400mA

Other _____

Other Special Requirements

Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)

Industrial and small business

EUT Power Cable

☐ Permanent OR ☐ Removable Length (in meters): _____

☐ Shielded OR ☐ Unshielded

☒ Not Applicable

EMC Test Plan and Constructional Data Form

EUT Interface Ports and Cables

Type			During Test		Qty	Shielding			Termination	Connector Type	Port Termination	Length tested (in meters)	Removable	Permanent
	Analog	Digital	Active	Passive		Yes	No	Type						
EXAMPLE: *RS232*	☐	☒	☒	☐	*2*	☒	☐	*Foil over braid*	*Coaxial*	*Metallized 9-pin D-Sub*	*Characteristic Impedance*	*6*	☒	☐
RS232	☐	☒	☐	☐	1	☒	☐	Foil over braid	Connector Shell	Metallized DB9		1	☒	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
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	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐

EMC Test Plan and Constructional Data Form

EUT Software.

Revision Level: A

Description: FCC Software - transmits data over wireless interface

Equipment Under Test (EUT) Operating Modes to be Tested -- list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing. Consult with your TÜV Product Service Representative if additional assistance is required.

1. Radiated emissions - UUT running code to transmit continuously over wireless interface.

2.

3.

Equipment Under Test (EUT) System Components -- List and describe all components which are part of the EUT. For FCC & Taiwan testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc)

Description	Model #	Serial #	FCC ID #
Digi Connect Wi ME	50000880-08	95011101 A	MCQ-50M880

EMC Test Plan and Constructional Data Form

Support Equipment -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc) This information is required for FCC & Taiwan testing.

Description	*Model #*	*Serial #*	*FCC ID #*
Digi Dev Board	55001086-02 RevB		N/A
HP Laptop	Compaq nc6320	CNU7062VS5	PD9WM3945ABG

Oscillator Frequencies

Manufacturer	*Frequency*	*Derived Frequency*	*Component # / Location*	*Description of Use*
	18.432 MHz		20000125/X1	Microprocessor
	44Mhz		20000147	RF Transceiver
	2.4 GHz (PLL)			Radio frequency

Power Supply

Manufacturer	*Model #*	*Serial #*	*Type*
			☐ Switched-mode: (Frequency) _____ ☐ Linear ☐ Other: _____
			☐ Switched-mode: (Frequency) _____ ☐ Linear ☐ Other: _____

Power Line Filters

Manufacturer	*Model #*	*Location in EUT*

EMC Test Plan and Constructional Data Form

Critical EMI Components (Capacitors, ferrites, etc.)

Description	*Manufacturer*	*Part # or Value*	*Qty*	*Component # / Location*

EMC Critical Detail -- Describe other EMC Design details used to reduce high frequency noise.

PLEASE ENTER NAMES BELOW (INSERT ELECTRONIC SIGNATURE IF POSSIBLE)

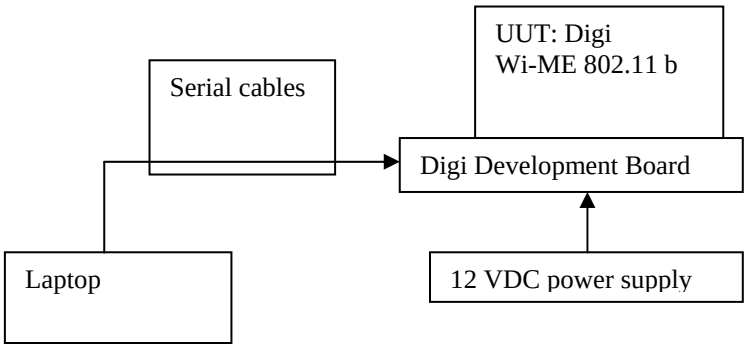
Authorization (Signature Required if a Third Party Certification is checked on pg 1)

Customer authorization to perform tests according to this test plan. — Date

Test Plan/CDF Prepared By (please print) — Date

EMC Block Diagram Form

System Configuration Block Diagram -- Provide a line drawing identifying the EUT, simulators, support equipment, I/O cables, power cables, and any other pertinent components to be used during testing. Use a dashed line to separate the equipment in the testing field versus equipment outside testing field.



Authorization Signatures

Customer authorization to perform tests according to this test plan. Date

Test Plan/CDF Prepared By (please print) Date

Appendix B

Measurement Protocol

MEASUREMENT PROTOCOL

GENERAL INFORMATION

Test Methodology

Emissions testing is performed according to the procedures in ANSI C63.4-2003, FCC KDB Publication 558074, the article “The Measurement of Occupied Bandwidth” by Industry Canada’s certification bureau, & FCC Public Notice DA 02-2138.

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system has a measurement uncertainty of ±1.8 dB. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. The test system has a measurement uncertainty of ±4.8 dB. The equipment comprising the test systems is 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 its 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

Final measurement levels are determined by connecting the antenna port of the DUT to a spectrum analyzer input via coaxial adapters, high frequency coax, and attenuators as necessary. The loss created by the interconnect apparatus is offset by settings within the analyzer. Specific analyzer settings are determined by the procedures throughout this report.

Radiated Emissions

The spectrum analyzer uses a quasi-peak detector for frequencies up to and including 1 GHz. For measurements above 1 GHz, peak and average detectors are used. The bandwidths used are 200 Hz from 9 kHz to 150 kHz, 9 kHz from 150 kHz to 30 MHz, 120 kHz from 30 MHz to 1000 MHz, and 1 MHz from 1 GHz to 40 GHz. Video bandwidths are at least three times greater than the IF bandwidth. Average measurements above 1 GHz are also achieved using a peak detector with 1 MHz RBW and 10 Hz VBW.

The final level, in dBμV/m, equals the reading from the spectrum analyzer (Level dBμV), adding the antenna correction factor and cable loss factor (Factor dB) to it, and subtracting the preamp gain (and duty cycle correction factor, if applicable). This result then has the limit subtracted from it to provide the Delta, which gives the tabular data as shown in the data. Intentional radiators are rotated through 3 orthogonal axes to determine the test position yielding the maximum emission levels.

Example:

FREQ (MHz)	LEVEL (dBuV)		CABLE/ANT/PREAMP (dB) (dB/m) (dB)			FINAL (dBuV/m)	POL/HGT/AZ	(m)	(deg)	DELTA1
60.80	42.5Qp	+	1.2	+ 10.9	- 25.5 =	29.1	V	1.0	0.0	-10.9

.

Test Equipment

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.