TEST RESULT SUMMARY

FCC Part 15 Subpart C Sections 15.247 & 15.207
Industry Canada's RSS-210 Issue 7 & RSS-Gen Issue 2

MANUFACTURER'S NAME	MultiTech Systems Incorporated
MANUFACTURER'S ADDRESS	2205 Woodale Drive Mounds View MN 55112
NAME OF EQUIPMENT	WLAN to Serial Module - 2.4 GHz DSSS
MODEL NUMBER(S) TESTED	MT800SWM
TEST REPORT NUMBER	WC705261 Rev A
TEST DATE(S)	01 February, 16 - 17 July, 18 September 2007

According to testing performed at TÜV America Inc, the above mentioned unit is in compliance with the applicable electromagnetic compatibility (EMC) portions of the requirements defined in FCC Part 15 Subpart C Sections 15.247 and 15.207 and Industry Canada's RSS-210 Issue 7 and RSS-Gen Issue 2

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 America Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the applicable EMC requirements of FCC Part 15 Subpart C Sections 15.247 *"Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz; General requirements."* and 15.207 "Conducted limits" and IC RSS-210 Issue 7 *"Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"* and IC RSS-Gen Issue 2 "*General Requirements and Information for the Certification of Radiocommunication Equipment".*

Date: 25 September 2007

Location: Taylors Falls MN USA

Greg Jakubowski
Senior EMC Technician

Joel Schneider
Senior EMC Engineer

Not Transferable

EMC TEST REPORT

Test Report File No.	:	**WC705261 Rev A**	Date of issue:	25 September 2007

Model / Serial No(s) Tested	:	MT800SWM / ---
Product Type	:	WLAN to Serial Module - 2.4 GHz DSSS
Applicant	:	MultiTech Systems Incorporated
Manufacturer	:	MultiTech Systems Incorporated
License holder	:	MultiTech Systems Incorporated
Address	:	2205 Woodale Drive Mounds View MN 55112

Test Result	:	■ **Positive**	☐ **Negative**
Test Project Number References	:	**WC705261 Rev A**	
Total pages including Appendices	:	**63**	

TÜV 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 America Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV America Inc issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval. This report shall not be used by the client to claim product endorsement by NVLAP, NIST, or any agency of the US government.

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

TÜV AMERICA INC 19333 Wild Mountain Road Taylors Falls MN 55084 Tel: (651) 638-0297 Fax: (651) 638-0298 Rev. 012907

DIRECTORY

Sign Explanations:
☐ - not applicable
■ - applicable

REVISION RECORD

REVISION	TOTAL NUMBER OF PAGES	DATE	DESCRIPTION
	53	31 August 2007	Initial Release
A	63	25 September 2007	▪ Added references to FCC part 15 section 15.207 including data, photo, test dates, etc. ▪ Added RBW & VBW to run 3 radiated emission band edge plots

EMC TEST REGULATIONS:

The tests were performed according to the following regulations :

☐ - EN 50081-1 / 1991
☐ - EN 55014-2: 1997 + Amendment A1: 2001 - Category __
☐ - EN 55024: 1998 + Amendments A1: 2001 + A2: 2003
☐ - EN 60601-1-2: 2001
☐ - EN 61000-6-1: 2001
☐ - EN 61000-6-2: 2001
☐ - EN 61326: 1997 + Amendments A1: 1998 + A2: 2001 + A3: 2003
☐ - EN 61800-3: 1996 + Amendment A11: 2000
☐ - ETS 300 683: 1997
☐ - ETS 300 683: 1997
☐ - ETSI EN 301 489-3 V1.4.1: 2002
☐ - EN 300 220-3 V1.1.1
☐ - EN 300 330-2 V1.1.1
■ - FCC Part 15 Subpart C Section 15.207
☐ - FCC Part 15 Subpart C Section 15.209
■ - FCC Part 15 Subpart C Section 15.247
☐ - FCC Part 15 Subpart C Section 15.249
■ - IC RSS-210 Issue 7
■ - IC RSS-Gen Issue 2
☐ - IC RSS-Gen Issue 1

ENVIRONMENTAL CONDITIONS IN THE LAB

	Actual
Temperature:	: 22 - 24 °C
Atmospheric pressure	: 98 kPa
Relative Humidity	: 52 - 61 %

POWER SUPPLY UTILIZED

Power supply system : Globtek GT 21089-1509-T3

TÜV AMERICA INC 19333 Wild Mountain Road Taylors Falls MN 55084 Tel: (651) 638-0297 Fax: (651) 638-0298 Rev. 012907

6 dB Bandwidth
FCC 15.247(a)(2), IC RSS-210 A8.2(1)

Test summary
The requirements are: ■ - MET ☐ - NOT MET
The minimum 6 dB bandwidth = 9.86 MHz

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

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3367	E4440A	Agilent	Spectrum Analyzer	MY42510439	14-Oct-07
3844	61697	NA	HF cable	---	Code B

Cal Code B = Calibration verification performed internally.

Test limit
Minimum 500 kHz

Test data
See following pages.

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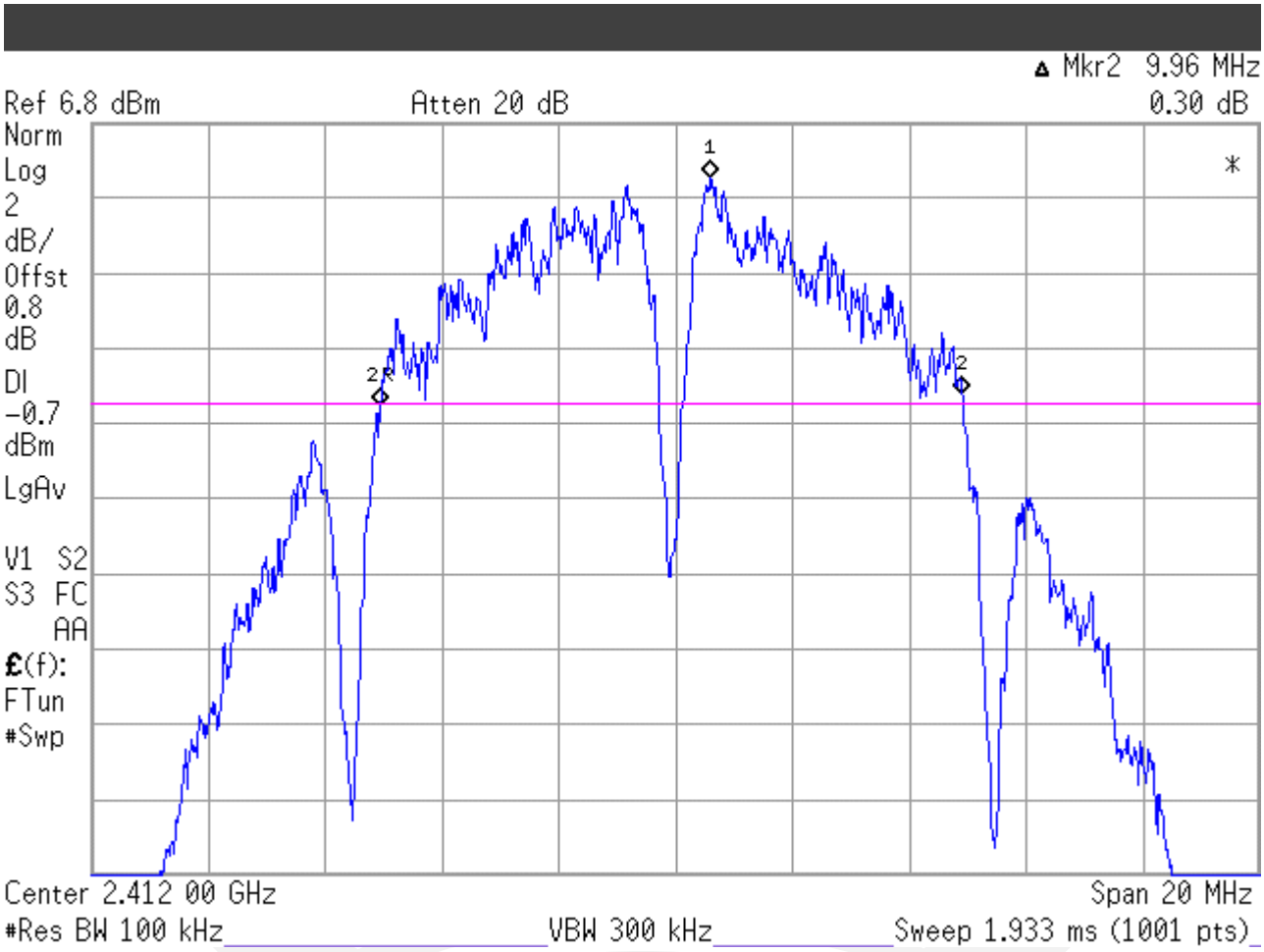
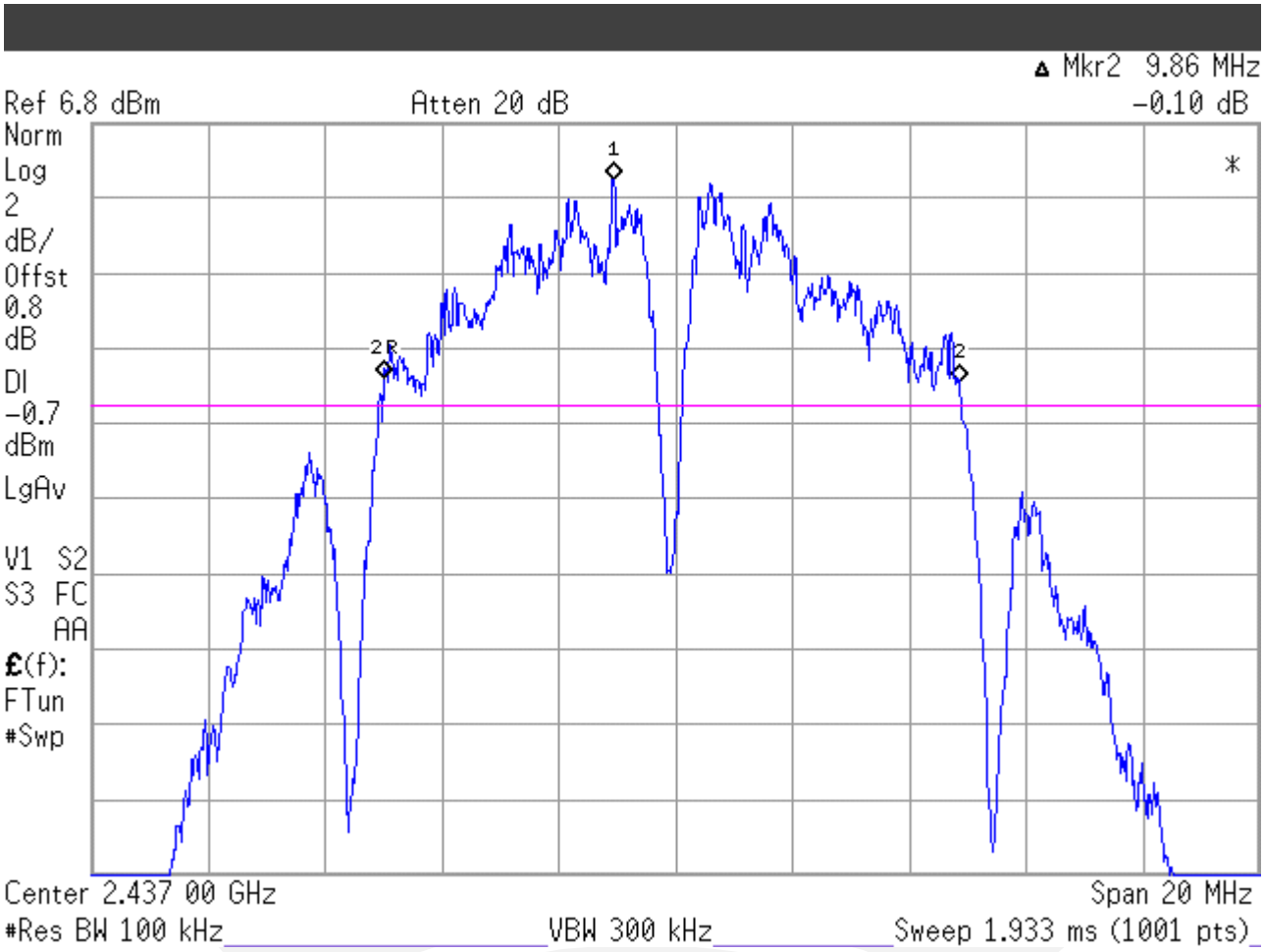
6 dB Bandwidth, low channel



6 dB Bandwidth, mid channel



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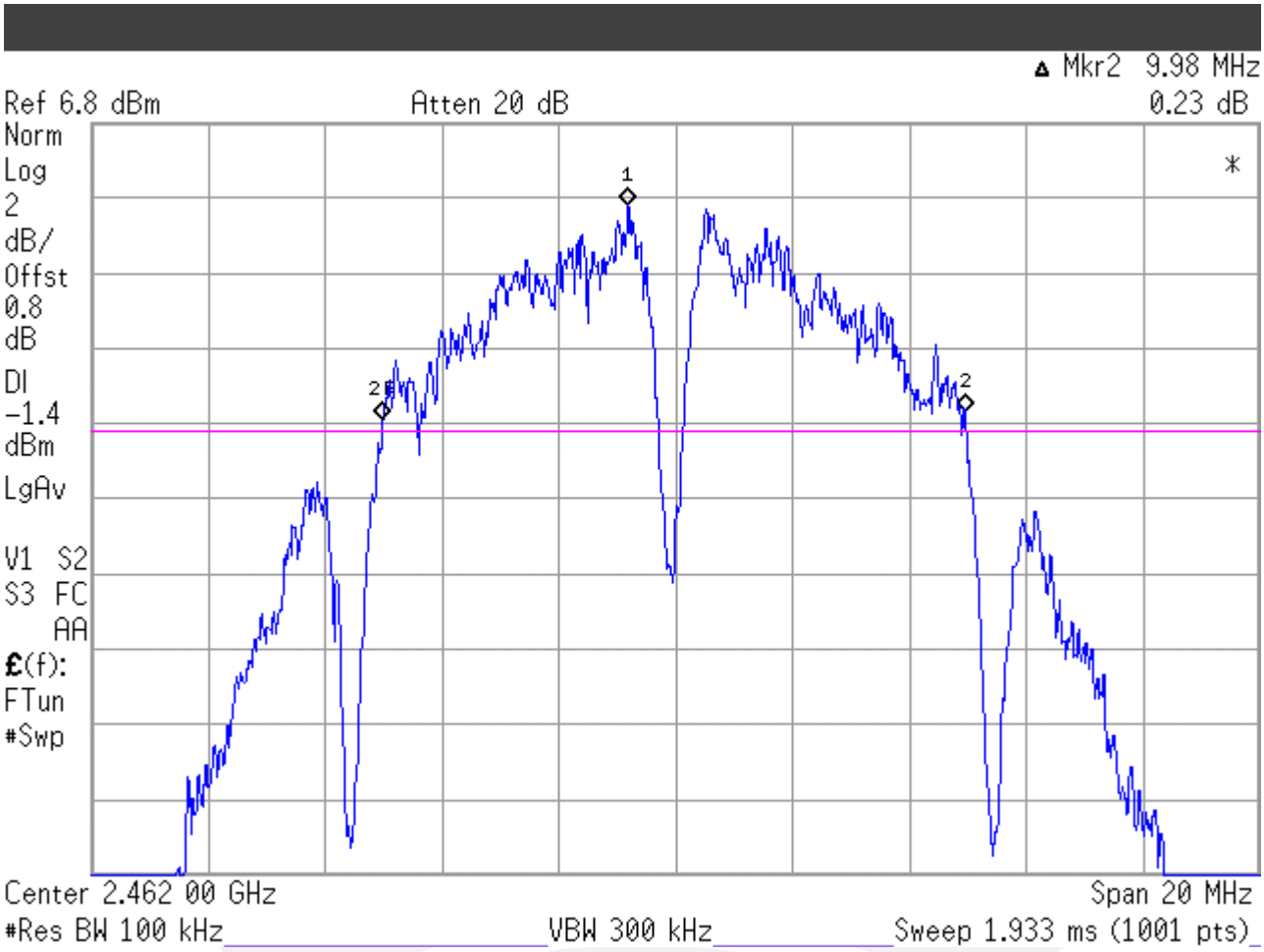
6 dB Bandwidth, high channel



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

Test summary
The requirements are: ■ - MET ☐ - NOT MET
Maximum conducted peak output power is 20.78 dBm or 120 milliwatts.
Antenna gain < 6 dBi

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

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3367	E4440A	Agilent	Spectrum Analyzer	MY42510439	14 Sep 07
3844	61697		HF cable		Code B 05 Jan 08

Cal Code B = Calibration verification performed internally.

Test limits
1 watt

Test data
See following pages.

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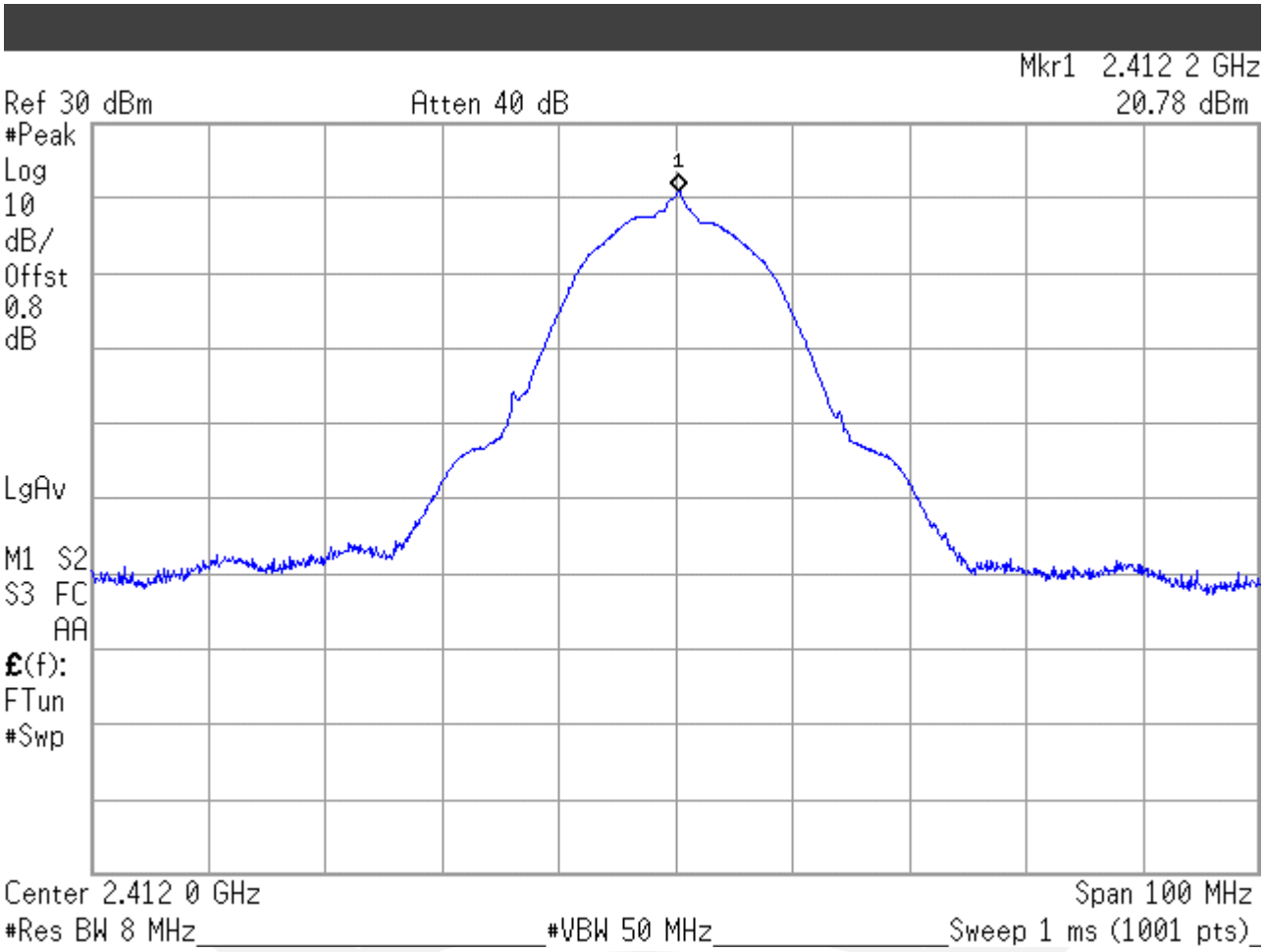
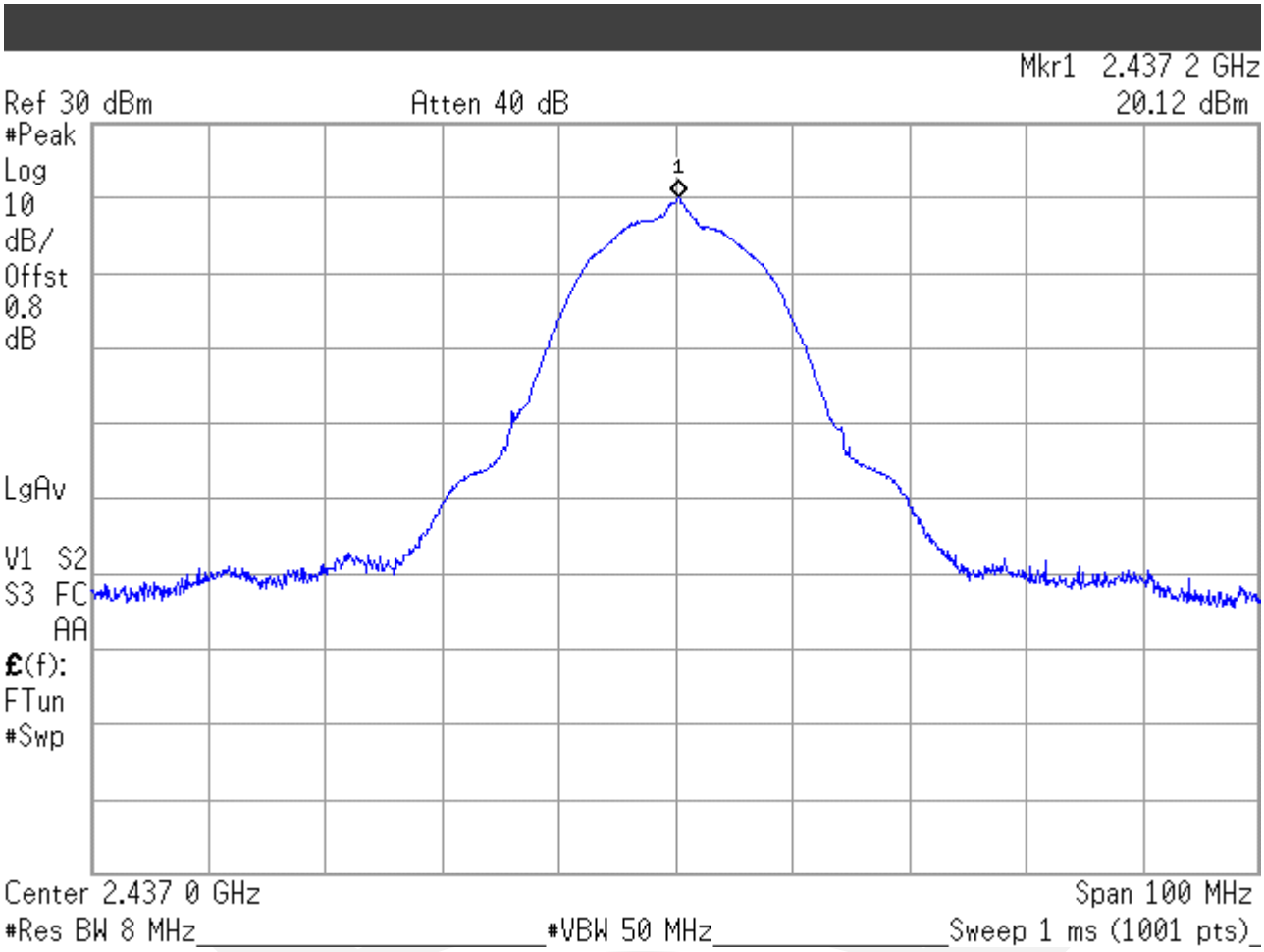
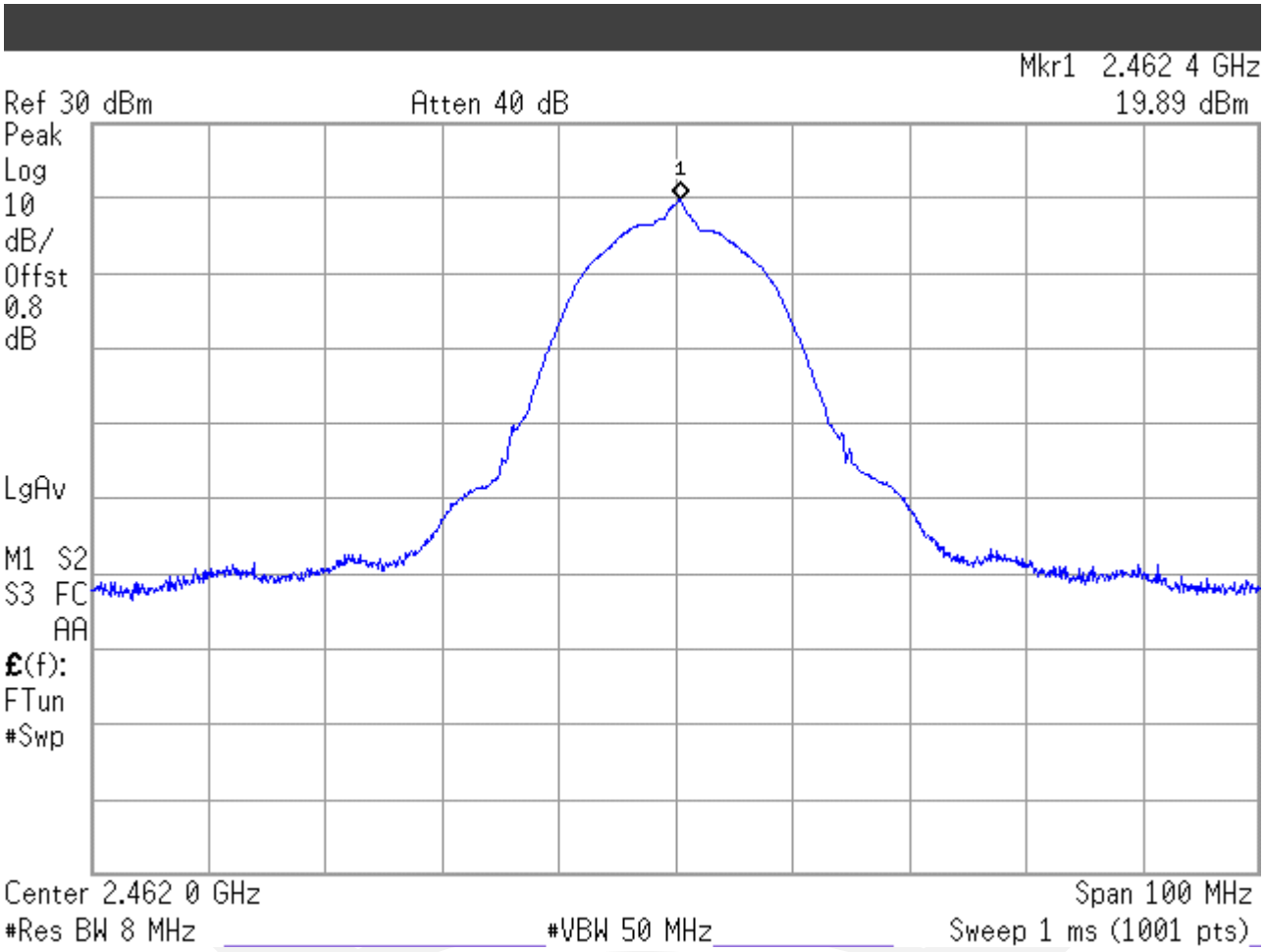
Maximum peak output power, low channel



Maximum peak output power, mid channel



Maximum peak output power, high channel



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

Test summary
The requirements are: ■ - MET ☐ - NOT MET
Minimum margin of compliance is 9.1 dB at the lower band edge.

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

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3367	E4440A	Agilent	Spectrum Analyzer	MY42510439	14 Sep 07
3844	61697		HF cable		Code B 05 Jan 08

Cal Code B = Calibration verification performed internally.

Test limit
-20 dBc

Test data
See following pages.

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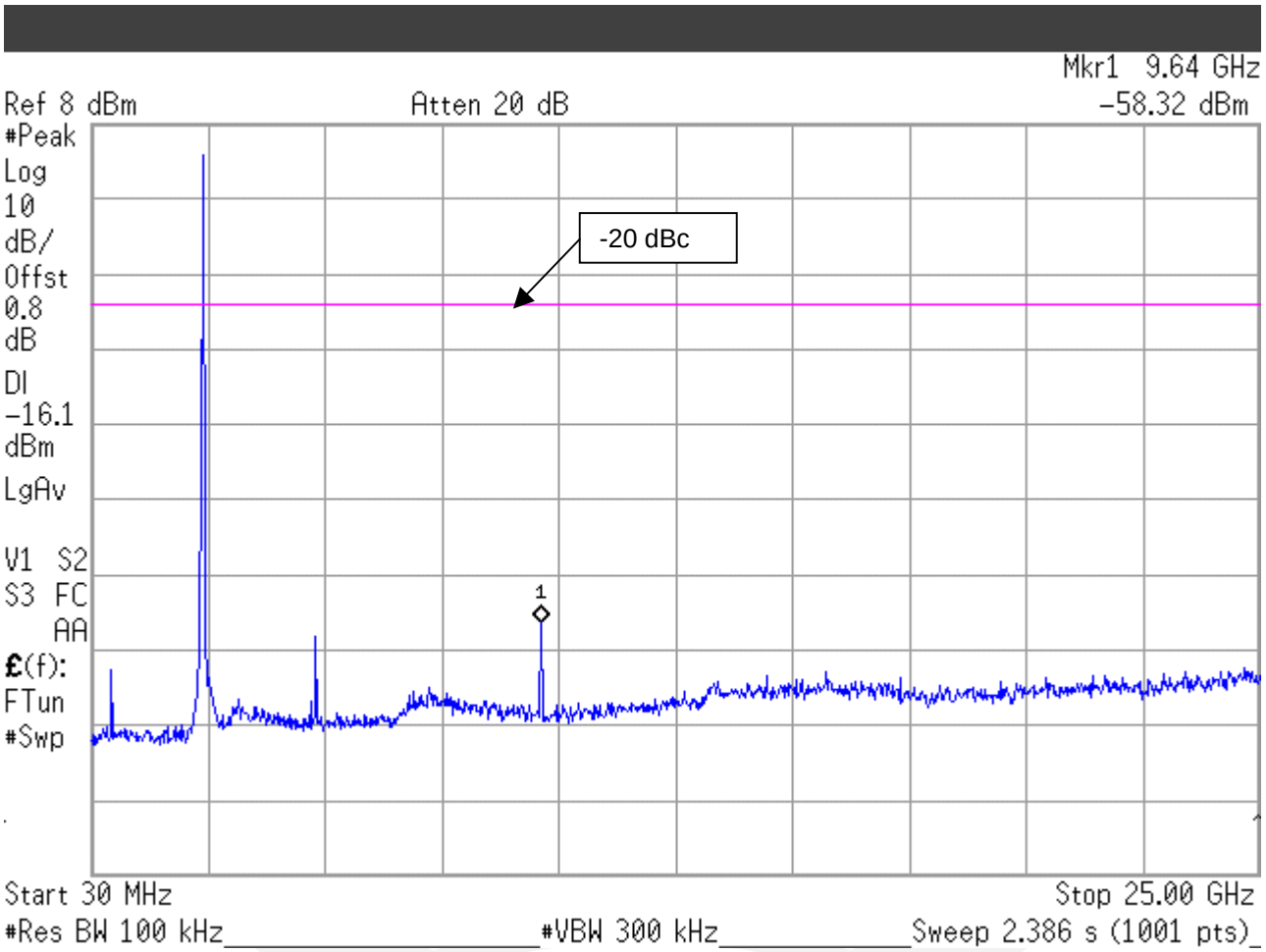
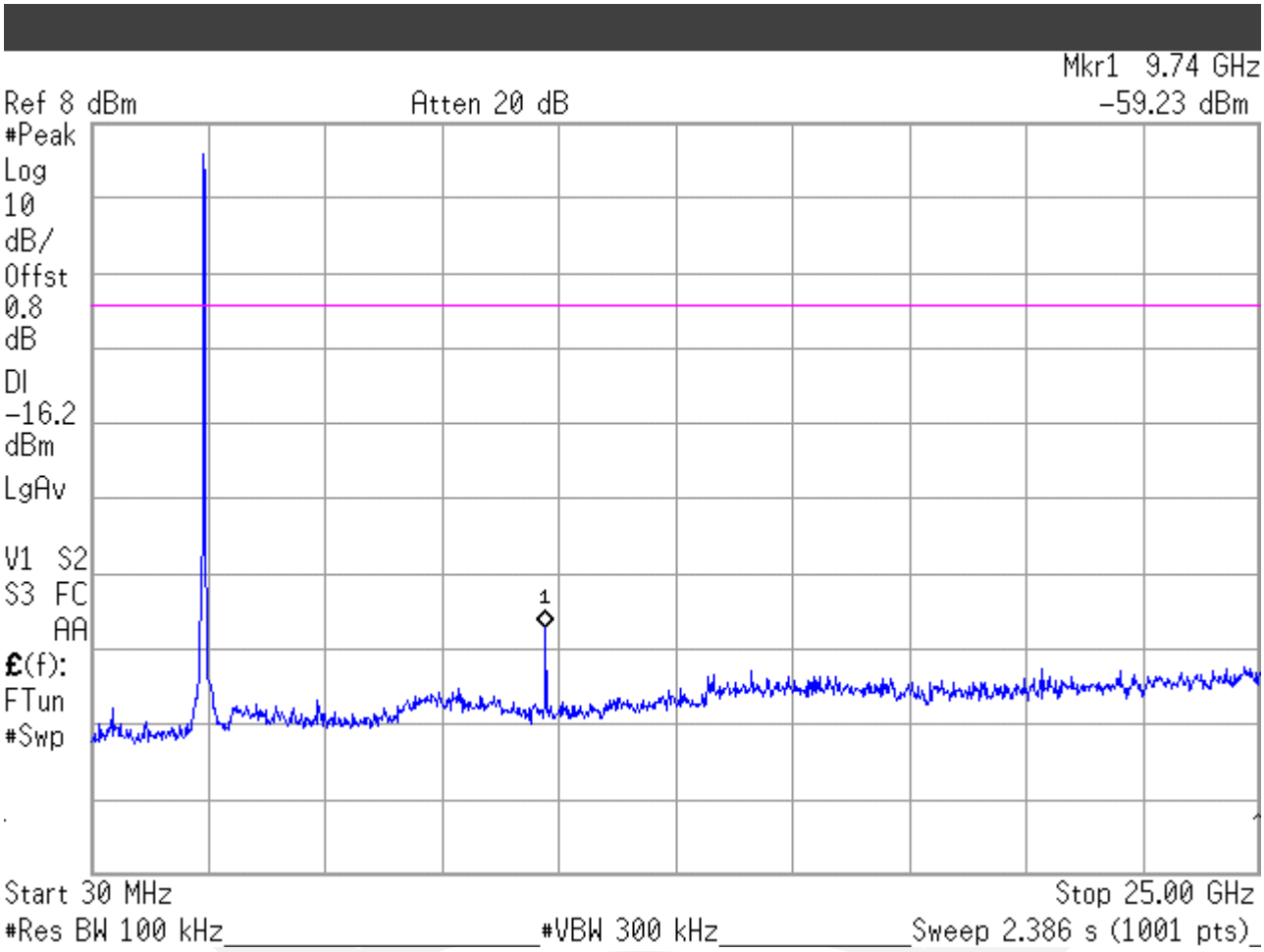
Spurious emissions, low channel



Spurious emissions, mid channel



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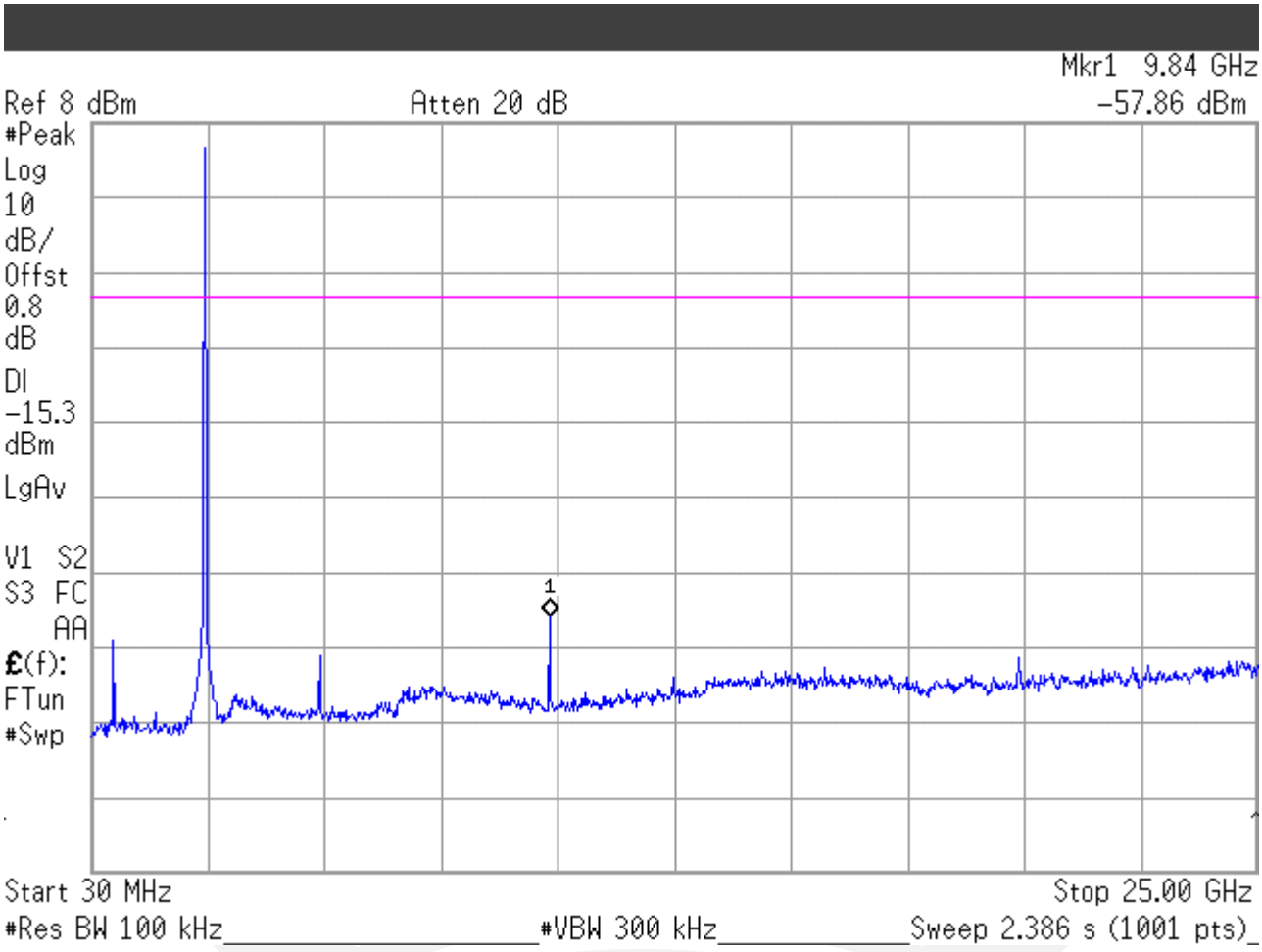
Spurious emissions, high channel



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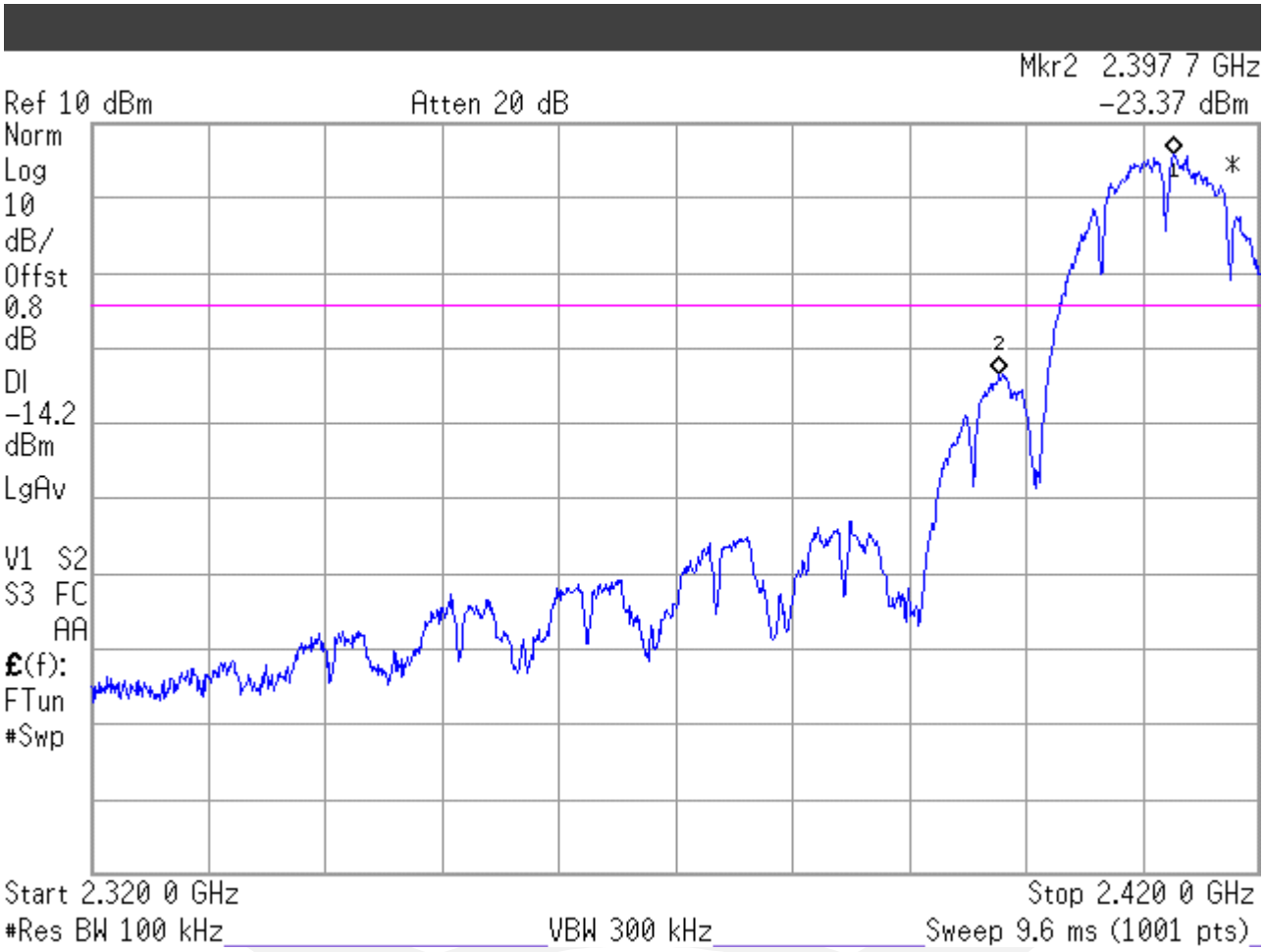
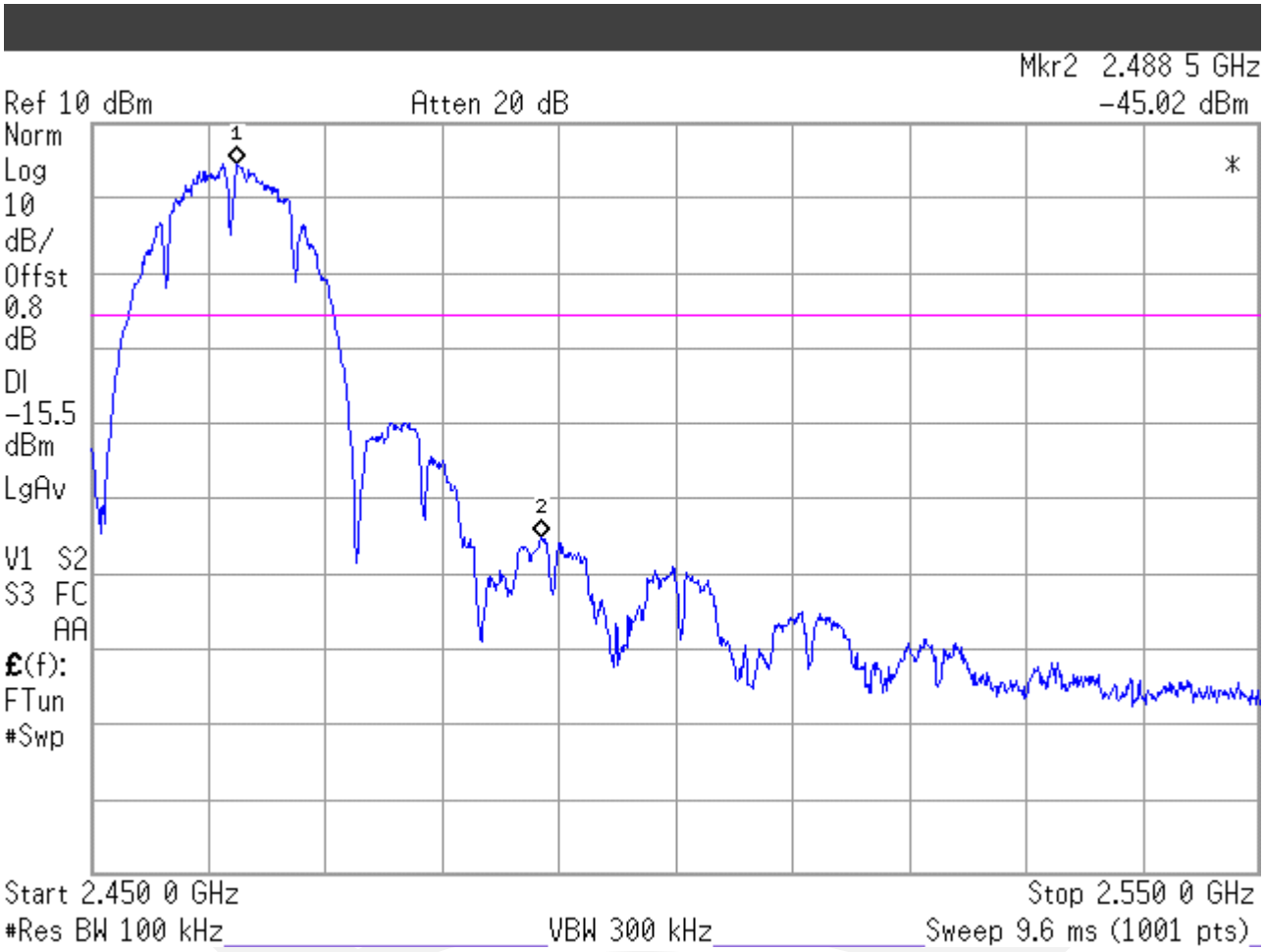
Spurious emissions - band edge low



Spurious emissions - band edge high



Spurious emissions - Radiated in restricted bands
FCC 15.247(d), IC RSS-210 A8.5

Test summary
The requirements are: ■ - MET ☐ - NOT MET
Minimum margin of compliance for spurious emissions is 2.7 dB at 4.824 GHz
Data below 1 GHz from file number WC700538

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

Test distance
■ - 3 meters
☐ - 10 meters

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
2075	3115	EMCO	Ridge Guide Ant. 1-18 GHz	9001-3275	12-Jan-08
2477	AFT-8434	Avantek	Preamplifier 4-8 GHz	2613A92801	Code B 09-May-08
3847	ZHL-1042J	Mini-Circuits	Preamplifier 10 - 3000 MHz	0607	Code B 08 May 08
2478	AWT-18037	Avantek	Preamplifier 8-18 GHz	1001-9226	Code B 09-May-08
3997	EWT-14-0066	EWT	2.4 GHz Notch filter	E2	Code B 05 Jan 08
3294	8566B	Hewlett-Packard	Spectrum Analyzer	2349A03098	16-May-08
3295	85662A	Hewlett-Packard	Analyzer Display	2349A06144	16-May-08
2681	85650A	Hewlett-Packard	Quasi-Peak Adapter	2430A00562	23-Mar-08
3367	E4440A	Agilent	Spectrum Analyzer	MY42510439	14 Sep 07
3978	SL26-3010	Phase One Microwave	Amplifier 18-26.5 GHz	0005	26 Mar 08
6717	3116	EMCO	Ridge Guide Ant 18-40 GHz	2005	05 Oct 07
3203	EM-6917B	Electro-Metrics	Biconicalog Periodic	106	23-May-08

Cal Code B = Calibration verification performed internally.

Test limit (in restricted bands)

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.

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RADIATED EMISSIONS

Test Report #:	WC700538 Run 1	Test Area:	LTS		
EUT Model #:	MT800SWM	Date:	2/1/2007		
EUT Serial #:	N/A	EUT Power:	50Hz/230VAC	Temperature:	21.0 °C
Test Method:	EN300-328			Air Pressure:	99.0 kPa
Customer:	MULTI-TECH			Rel. Humidity:	20.0 %
EUT Description:	802.11b SERIAL TO WIRELESS MODULE				
Notes:	TRANSMITTER SPURIOUS				
Data File Name:	0538.dat			Page:	1 of 7

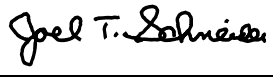
List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 EN300328 NB Tx @3m	DELTA2
Begin scan 30 - 2000 MHz						
Low channel, low power, modulated						
353.855 MHz	36.1 Pk	1.92 / 14.95 / 29.81 / 0.0	23.16	V / 1.50 / 0	-36.04	n/a
Near field probe, preamp off during measurement, recording frequency only						
14.7456MHz multiples						
58.982 MHz	27.9 Pk	0.72 / 11.77 / 29.72 / 0.0	10.67	V / 1.50 / 0	-48.53	n/a
117.965 MHz	27.55 Pk	0.99 / 9.08 / 29.57 / 0.0	8.06	V / 1.50 / 0	-51.14	n/a
176.947 MHz	29.35 Pk	1.27 / 9.91 / 29.53 / 0.0	11.01	V / 1.50 / 0	-48.19	n/a
235.93 MHz	27.8 Pk	1.45 / 11.55 / 29.62 / 0.0	11.18	V / 1.50 / 0	-48.02	n/a
353.912 MHz	30.55 Pk	1.92 / 14.95 / 29.81 / 0.0	17.61	V / 1.50 / 0	-41.59	n/a
412.895 MHz	27.3 Pk	2.02 / 16.08 / 29.91 / 0.0	15.49	V / 1.50 / 0	-43.71	n/a
471.883 MHz	27.95 Pk	2.09 / 17.31 / 30.0 / 0.0	17.35	V / 1.50 / 0	-41.85	n/a
530.866 MHz	26.05 Pk	2.23 / 18.0 / 30.09 / 0.0	16.19	V / 1.50 / 0	-43.01	n/a
589.848 MHz	31.1 Pk	2.46 / 19.14 / 30.19 / 0.0	22.51	V / 1.50 / 0	-36.69	n/a
648.83 MHz	29.5 Pk	2.56 / 19.97 / 30.13 / 0.0	21.9	V / 1.50 / 0	-37.3	n/a
707.831 MHz	31.05 Pk	2.64 / 20.88 / 30.05 / 0.0	24.52	V / 1.50 / 0	-34.68	n/a
825.796 MHz	26.55 Pk	2.78 / 21.75 / 29.89 / 0.0	21.2	V / 1.50 / 0	-38.0	n/a
884.778 MHz	29.7 Pk	2.93 / 22.29 / 29.8 / 0.0	25.12	V / 1.50 / 0	-34.08	n/a
44MHz multiples						
44.0 MHz	26.65 Pk	0.49 / 15.89 / 29.94 / 0.0	13.09	V / 1.50 / 0	-46.11	n/a
88.004 MHz	27.0 Pk	0.91 / 7.66 / 29.52 / 0.0	6.05	V / 1.50 / 0	-53.15	n/a
132.006 MHz	28.2 Pk	1.04 / 8.51 / 29.59 / 0.0	8.16	V / 1.50 / 0	-51.04	n/a
176.008 MHz	29.65 Pk	1.27 / 9.85 / 29.53 / 0.0	11.24	V / 1.50 / 0	-47.96	n/a

Tested by: Greg Jakubowski — Printed

 — Signature

Reviewed by: J. T. Schneider — Printed

 — Signature

RADIATED EMISSIONS

Test Report #:	WC700538 Run 1	Test Area:	LTS		
EUT Model #:	MT800SWM	Date:	2/1/2007		
EUT Serial #:	N/A	EUT Power:	50Hz/230VAC	Temperature:	21.0 °C
Test Method:	EN300-328			Air Pressure:	99.0 kPa
Customer:	MULTI-TECH			Rel. Humidity:	20.0 %
EUT Description:	802.11b SERIAL TO WIRELESS MODULE				
Notes:	TRANSMITTER SPURIOUS				
Data File Name:	0538.dat			Page:	2 of 7

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 EN300328 NB Tx @3m	DELTA2
220.01 MHz	30.75 Pk	1.42 / 11.09 / 29.6 / 0.0	13.66	V / 1.50 / 0	-45.54	n/a
264.012 MHz	28.5 Pk	1.52 / 12.36 / 29.67 / 0.0	12.71	V / 1.50 / 0	-46.49	n/a
308.014 MHz	30.3 Pk	1.74 / 13.63 / 29.74 / 0.0	15.93	V / 1.50 / 0	-43.27	n/a
352.016 MHz	27.75 Pk	1.92 / 14.89 / 29.81 / 0.0	14.75	V / 1.50 / 0	-44.45	n/a
396.018 MHz	30.55 Pk	2.0 / 15.73 / 29.88 / 0.0	18.4	V / 1.50 / 0	-40.8	n/a
440.02 MHz	29.6 Pk	2.05 / 16.65 / 29.95 / 0.0	18.35	V / 1.50 / 0	-40.85	n/a
484.022 MHz	27.05 Pk	2.1 / 17.57 / 30.02 / 0.0	16.7	V / 1.50 / 0	-42.5	n/a
484.022 MHz	30.15 Pk	2.1 / 17.57 / 30.02 / 0.0	19.8	V / 1.50 / 0	-39.4	n/a
528.024 MHz	27.5 Pk	2.22 / 17.95 / 30.09 / 0.0	17.58	V / 1.50 / 0	-41.62	n/a
572.026 MHz	25.9 Pk	2.37 / 18.79 / 30.16 / 0.0	16.91	V / 1.50 / 0	-42.29	n/a
616.028 MHz	29.9 Pk	2.52 / 19.64 / 30.17 / 0.0	21.89	V / 1.50 / 0	-37.31	n/a
660.03 MHz	30.3 Pk	2.57 / 19.8 / 30.11 / 0.0	22.56	V / 1.50 / 0	-36.64	n/a
Antenna, preamp on						
44.0 MHz	27.8 Pk	0.49 / 15.89 / 29.94 / 0.0	14.24	V / 1.50 / 0	-44.96	n/a
58.982 MHz	30.25 Pk	0.72 / 11.77 / 29.72 / 0.0	13.02	V / 1.50 / 0	-46.18	n/a
88.004 MHz	32.8 Pk	0.91 / 7.66 / 29.52 / 0.0	11.85	V / 1.50 / 0	-47.35	n/a
117.965 MHz	31.35 Pk	0.99 / 9.08 / 29.57 / 0.0	11.86	V / 1.50 / 0	-47.34	n/a
132.006 MHz	32.1 Pk	1.04 / 8.51 / 29.59 / 0.0	12.06	V / 1.50 / 0	-47.14	n/a
176.008 MHz	28.75 Pk	1.27 / 9.85 / 29.53 / 0.0	10.34	V / 1.50 / 0	-48.86	n/a
176.947 MHz	32.35 Pk	1.27 / 9.91 / 29.53 / 0.0	14.01	V / 1.50 / 0	-45.19	n/a
220.01 MHz	29.65 Pk	1.42 / 11.09 / 29.6 / 0.0	12.56	V / 1.50 / 0	-46.64	n/a
235.93 MHz	33.8 Pk	1.45 / 11.55 / 29.62 / 0.0	17.18	V / 1.50 / 0	-42.02	n/a
264.012 MHz	28.35 Pk	1.52 / 12.36 / 29.67 / 0.0	12.56	V / 1.50 / 0	-46.64	n/a
308.014 MHz	26.9 Pk	1.74 / 13.63 / 29.74 / 0.0	12.53	V / 1.50 / 0	-46.67	n/a
352.016 MHz	28.95 Pk	1.92 / 14.89 / 29.81 / 0.0	15.95	V / 1.50 / 0	-43.25	n/a

Tested by: Greg Jakubowski

Printed

Signature

Reviewed by: J. T. Schneider

Printed

Signature

RADIATED EMISSIONS

Test Report #:	WC700538 Run 1	Test Area:	LTS		
EUT Model #:	MT800SWM	Date:	2/1/2007		
EUT Serial #:	N/A	EUT Power:	50Hz/230VAC	Temperature:	21.0 °C
Test Method:	EN300-328			Air Pressure:	99.0 kPa
Customer:	MULTI-TECH			Rel. Humidity:	20.0 %
EUT Description:	802.11b SERIAL TO WIRELESS MODULE				
Notes:	TRANSMITTER SPURIOUS				
Data File Name:	0538.dat			Page:	3 of 7

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 EN300328 NB Tx @3m	DELTA2
353.915 MHz	37.4 Pk	1.92 / 14.95 / 29.81 / 0.0	24.46	V / 1.50 / 0	-34.74	n/a
396.018 MHz	30.4 Pk	2.0 / 15.73 / 29.88 / 0.0	18.25	V / 1.50 / 0	-40.95	n/a
412.895 MHz	28.15 Pk	2.02 / 16.08 / 29.91 / 0.0	16.34	V / 1.50 / 0	-42.86	n/a
440.02 MHz	27.55 Pk	2.05 / 16.65 / 29.95 / 0.0	16.3	V / 1.50 / 0	-42.9	n/a
471.883 MHz	28.65 Pk	2.09 / 17.31 / 30.0 / 0.0	18.05	V / 1.50 / 0	-41.15	n/a
484.022 MHz	30.9 Pk	2.1 / 17.57 / 30.02 / 0.0	20.55	V / 1.50 / 0	-38.65	n/a
528.024 MHz	30.15 Pk	2.22 / 17.95 / 30.09 / 0.0	20.23	V / 1.50 / 0	-38.97	n/a
530.866 MHz	30.15 Pk	2.23 / 18.0 / 30.09 / 0.0	20.29	V / 1.50 / 0	-38.91	n/a
572.026 MHz	29.45 Pk	2.37 / 18.79 / 30.16 / 0.0	20.46	V / 1.50 / 0	-38.74	n/a
589.848 MHz	29.4 Pk	2.46 / 19.14 / 30.19 / 0.0	20.81	V / 1.50 / 0	-38.39	n/a
616.028 MHz	29.15 Pk	2.52 / 19.64 / 30.17 / 0.0	21.14	V / 1.50 / 0	-38.06	n/a
648.83 MHz	30.15 Pk	2.56 / 19.97 / 30.13 / 0.0	22.55	V / 1.50 / 0	-36.65	n/a
660.03 MHz	31.65 Pk	2.57 / 19.8 / 30.11 / 0.0	23.91	V / 1.50 / 0	-35.29	n/a
707.831 MHz	27.95 Pk	2.64 / 20.88 / 30.05 / 0.0	21.42	V / 1.50 / 0	-37.78	n/a
825.796 MHz	25.75 Pk	2.78 / 21.75 / 29.89 / 0.0	20.4	V / 1.50 / 0	-38.8	n/a
884.778 MHz	31.15 Pk	2.93 / 22.29 / 29.8 / 0.0	26.57	V / 1.50 / 0	-32.63	n/a
235.93 MHz	36.1 Pk	1.45 / 11.55 / 29.62 / 0.0	19.48	V / 1.50 / 180	-39.72	n/a
353.915 MHz	38.4 Pk	1.92 / 14.95 / 29.81 / 0.0	25.46	H / 1.50 / 180	-33.74	n/a
825.796 MHz	30.75 Pk	2.78 / 21.75 / 29.89 / 0.0	25.4	H / 1.50 / 90	-33.8	n/a
Mid channel, low power - No additional or higher emissions detected						
High channel, low power - No additional or higher emissions detected						
High channel, high power						

Tested by: Greg Jakubowski

Printed

Signature

Reviewed by: J. T. Schneider

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Signature

RADIATED EMISSIONS

Test Report #:	WC700538 Run 1	Test Area:	LTS		
EUT Model #:	MT800SWM	Date:	2/1/2007		
EUT Serial #:	N/A	EUT Power:	50Hz/230VAC	Temperature:	21.0 °C
Test Method:	EN300-328			Air Pressure:	99.0 kPa
Customer:	MULTI-TECH			Rel. Humidity:	20.0 %
EUT Description:	802.11b SERIAL TO WIRELESS MODULE				
Notes:	TRANSMITTER SPURIOUS				
Data File Name:	0538.dat			Page:	4 of 7

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 EN300328 NB Tx @3m	DELTA2
353.915 MHz	37.4 Pk	1.92 / 14.95 / 29.81 / 0.0	24.46	V / 1.50 / 0	-34.74	n/a

Mid channel, high power - No additional or higher emissions detected
Low channel, high power - No additional or higher emissions detected

End transmitter spurious scan 30 - 2000 MHz
Low, mid, & high channels, low & high power

Receive / standby mode is not applicable.
Normal function is transmit & receive operating simultaneously

Substitution performed at highest emission, 884.778 MHz
Signal generator level = -57.4 dBm
Cable loss = 2.3 dB
Dipole antenna gain = -6.21 dBi
-57.4 dBm - 2.3 dB + -6.21 dBi = -67.61 dBm

The thoeretical field strength limit used in this data is ~ 1 dB lower
than the limit determined by the substitution exercise

Tested by: Greg Jakubowski — Printed — Signature

Reviewed by: J. T. Schneider — Printed — Signature

RADIATED EMISSIONS

Test Report #:	WC700538 Run 1	Test Area:	LTS		
EUT Model #:	MT800SWM	Date:	2/1/2007		
EUT Serial #:	N/A	EUT Power:	50Hz/230VAC	Temperature:	21.0 °C
Test Method:	EN300-328			Air Pressure:	99.0 kPa
Customer:	MULTI-TECH			Rel. Humidity:	20.0 %
EUT Description:	802.11b SERIAL TO WIRELESS MODULE				
Notes:	TRANSMITTER SPURIOUS				
Data File Name:	0538.dat			Page:	5 of 7

Measurement summary for limit1: EN300328 NB Tx @3m (Pk)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 EN300328 NB Tx @3m
884.778 MHz	31.15 Pk	2.93 / 22.29 / 29.8 / 0.0	26.57	V / 1.50 / 0	-32.63
353.915 MHz	38.4 Pk	1.92 / 14.95 / 29.81 / 0.0	25.46	H / 1.50 / 180	-33.74
825.796 MHz	30.75 Pk	2.78 / 21.75 / 29.89 / 0.0	25.4	H / 1.50 / 90	-33.8
707.831 MHz	31.05 Pk	2.64 / 20.88 / 30.05 / 0.0	24.52	V / 1.50 / 0	-34.68
660.03 MHz	31.65 Pk	2.57 / 19.8 / 30.11 / 0.0	23.91	V / 1.50 / 0	-35.29
648.83 MHz	30.15 Pk	2.56 / 19.97 / 30.13 / 0.0	22.55	V / 1.50 / 0	-36.65
589.848 MHz	31.1 Pk	2.46 / 19.14 / 30.19 / 0.0	22.51	V / 1.50 / 0	-36.69
616.028 MHz	29.9 Pk	2.52 / 19.64 / 30.17 / 0.0	21.89	V / 1.50 / 0	-37.31
484.022 MHz	30.9 Pk	2.1 / 17.57 / 30.02 / 0.0	20.55	V / 1.50 / 0	-38.65
572.026 MHz	29.45 Pk	2.37 / 18.79 / 30.16 / 0.0	20.46	V / 1.50 / 0	-38.74
530.866 MHz	30.15 Pk	2.23 / 18.0 / 30.09 / 0.0	20.29	V / 1.50 / 0	-38.91
528.024 MHz	30.15 Pk	2.22 / 17.95 / 30.09 / 0.0	20.23	V / 1.50 / 0	-38.97
235.93 MHz	36.1 Pk	1.45 / 11.55 / 29.62 / 0.0	19.48	V / 1.50 / 180	-39.72
396.018 MHz	30.55 Pk	2.0 / 15.73 / 29.88 / 0.0	18.4	V / 1.50 / 0	-40.8
440.02 MHz	29.6 Pk	2.05 / 16.65 / 29.95 / 0.0	18.35	V / 1.50 / 0	-40.85
471.883 MHz	28.65 Pk	2.09 / 17.31 / 30.0 / 0.0	18.05	V / 1.50 / 0	-41.15
412.895 MHz	28.15 Pk	2.02 / 16.08 / 29.91 / 0.0	16.34	V / 1.50 / 0	-42.86
352.016 MHz	28.95 Pk	1.92 / 14.89 / 29.81 / 0.0	15.95	V / 1.50 / 0	-43.25
308.014 MHz	30.3 Pk	1.74 / 13.63 / 29.74 / 0.0	15.93	V / 1.50 / 0	-43.27
44.0 MHz	27.8 Pk	0.49 / 15.89 / 29.94 / 0.0	14.24	V / 1.50 / 0	-44.96
176.947 MHz	32.35 Pk	1.27 / 9.91 / 29.53 / 0.0	14.01	V / 1.50 / 0	-45.19
220.01 MHz	30.75 Pk	1.42 / 11.09 / 29.6 / 0.0	13.66	V / 1.50 / 0	-45.54
58.982 MHz	30.25 Pk	0.72 / 11.77 / 29.72 / 0.0	13.02	V / 1.50 / 0	-46.18
264.012 MHz	28.5 Pk	1.52 / 12.36 / 29.67 / 0.0	12.71	V / 1.50 / 0	-46.49
132.006 MHz	32.1 Pk	1.04 / 8.51 / 29.59 / 0.0	12.06	V / 1.50 / 0	-47.14
117.965 MHz	31.35 Pk	0.99 / 9.08 / 29.57 / 0.0	11.86	V / 1.50 / 0	-47.34

Tested by: Greg Jakubowski — Printed — Signature

Reviewed by: J. T. Schneider — Printed — Signature

RADIATED EMISSIONS

Test Report #:	WC700538 Run 1	Test Area:	LTS		
EUT Model #:	MT800SWM	Date:	2/1/2007		
EUT Serial #:	N/A	EUT Power:	50Hz/230VAC	Temperature:	21.0 °C
Test Method:	EN300-328			Air Pressure:	99.0 kPa
Customer:	MULTI-TECH			Rel. Humidity:	20.0 %
EUT Description:	802.11b SERIAL TO WIRELESS MODULE				
Notes:	TRANSMITTER SPURIOUS				
Data File Name:	0538.dat			Page:	6 of 7

Measurement summary for limit1: EN300328 NB Tx @3m (Pk)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 EN300328 NB Tx @3m
88.004 MHz	32.8 Pk	0.91 / 7.66 / 29.52 / 0.0	11.85	V / 1.50 / 0	-47.35
176.008 MHz	29.65 Pk	1.27 / 9.85 / 29.53 / 0.0	11.24	V / 1.50 / 0	-47.96

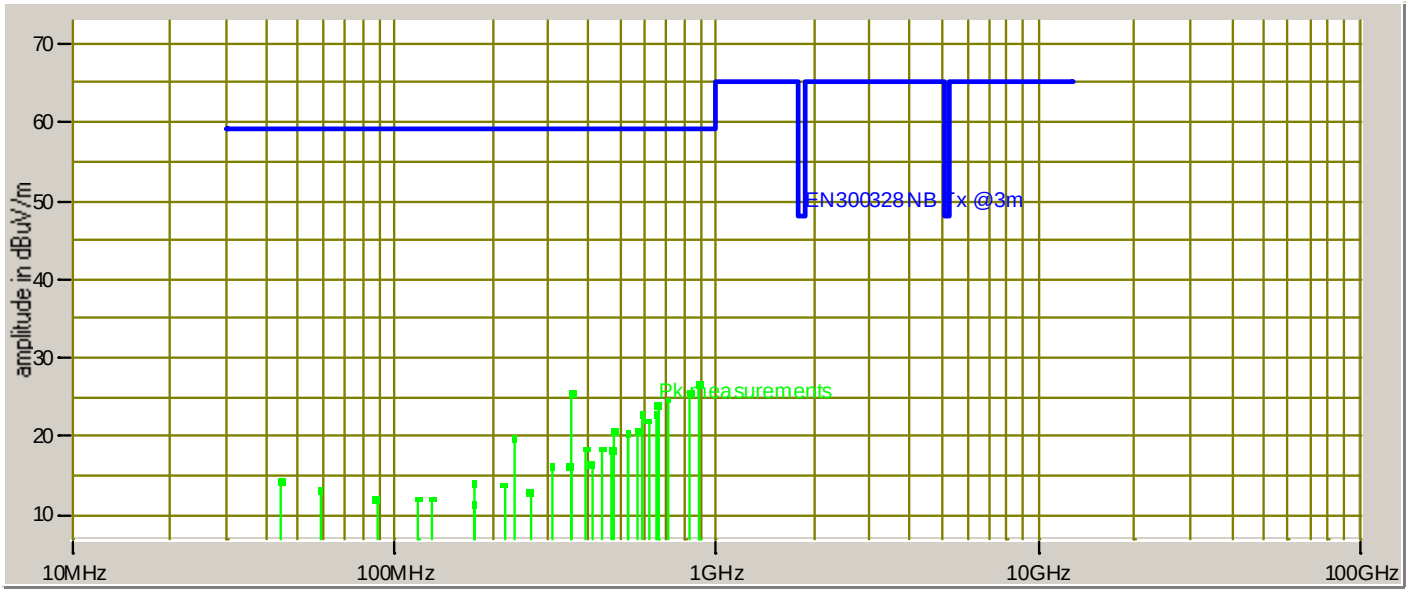
Tested by: Greg Jakubowski — Printed — Signature

Reviewed by: J. T. Schneider — Printed — Signature

RADIATED EMISSIONS

Test Report #:	WC700538 Run 1	Test Area:	LTS		
EUT Model #:	MT800SWM	Date:	2/1/2007		
EUT Serial #:	N/A	EUT Power:	50Hz/230VAC	Temperature:	21.0 °C
Test Method:	EN300-328			Air Pressure:	99.0 kPa
Customer:	MULTI-TECH			Rel. Humidity:	20.0 %
EUT Description:	802.11b SERIAL TO WIRELESS MODULE				
Notes:	TRANSMITTER SPURIOUS				
Data File Name:	0538.dat			Page:	7 of 7

Graph:



Tested by: Greg Jakubowski

Printed | Signature

Reviewed by: J. T. Schneider

Printed | Signature

RADIATED EMISSIONS

Test Report #:	WC705261 Run 3	Test Area:	LTS		
EUT Model #:	MT800SWM	Date:	7/16/2007		
EUT Serial #:	n/a	EUT Power:	60Hz/120VAC	Temperature:	24.0 °C
Test Method:	FCC B			Air Pressure:	98.0 kPa
Customer:	Multi-Tech			Rel. Humidity:	52.0 %
EUT Description:	Serial to wireless ethernet module				
Notes:	5 dBi antenna (long)				
Data File Name:	5261.dat			Page:	1 of 6

List of measurements for run #: 3

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC B >1GHz 3m avg	DELTA2 FCC B >1G 3 M pk
Rate 1 Mbps, mode pseudo random						
5 dBi antenna (long)						
Ch 11, gain 220						
Maximized						
4.924 GHz	49.62 Av	7.64 / 33.05 / 39.9 / 0.28	50.7	V / 2.07 / 317	-3.3	n/a
4.924 GHz	55.8 Pk	7.64 / 33.05 / 39.9 / 0.0	56.59	V / 2.10 / 317	2.59*	-17.41
No other significant emissions detected from 1 - 25 GHz						
Ch 1, gain 220						
4.824 GHz	50.73 Av	7.61 / 32.85 / 40.2 / 0.28	51.27	V / 2.24 / 261	-2.73	n/a
4.824 GHz	57.0 Pk	7.61 / 32.85 / 40.2 / 0.28	57.54	V / 2.24 / 261	3.54*	-16.46
No other significant emissions detected from 1 - 25 GHz						
Ch 6, gain 220						
4.874 GHz	48.74 Av	7.63 / 32.95 / 39.9 / 0.28	49.7	V / 2.17 / 258	-4.3	n/a
4.874 GHz	53.4 Pk	7.63 / 32.95 / 39.9 / 0.28	54.36	V / 2.17 / 258	0.36*	-19.64
No other significant emissions detected from 1 - 25 GHz						
End scan 1 - 25 GHz						

Tested by: Greg Jakubowski — Printed — Signature

Reviewed by: S. L. Rupp — Printed — Signature

RADIATED EMISSIONS

Test Report #:	WC705261 Run 3	Test Area:	LTS			
EUT Model #:	MT800SWM	Date:	7/16/2007			
EUT Serial #:	n/a	EUT Power:	60Hz/120VAC	Temperature:	24.0	°C
Test Method:	FCC B			Air Pressure:	98.0	kPa
Customer:	Multi-Tech			Rel. Humidity:	52.0	%
EUT Description:	Serial to wireless ethernet module					
Notes:	5 dBi antenna (long)					
Data File Name:	5261.dat			Page:	2 of 6	

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

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC B >1GHz 3m avg
4.824 GHz	50.73 Av	7.61 / 32.85 / 40.2 / 0.28	51.27	V / 2.24 / 261	-2.73
4.924 GHz	49.62 Av	7.64 / 33.05 / 39.9 / 0.28	50.7	V / 2.07 / 317	-3.3
4.874 GHz	48.74 Av	7.63 / 32.95 / 39.9 / 0.28	49.7	V / 2.17 / 258	-4.3
4.924 GHz	55.8 Pk	7.64 / 33.05 / 39.9 / 0.0	56.59	V / 2.10 / 317	2.59*
4.824 GHz	57.0 Pk	7.61 / 32.85 / 40.2 / 0.28	57.54	V / 2.24 / 261	3.54*
4.874 GHz	53.4 Pk	7.63 / 32.95 / 39.9 / 0.28	54.36	V / 2.17 / 258	0.36*

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

Reviewed by: S. L. Rupp — Printed — Susan L Rupp — Signature

RADIATED EMISSIONS

Test Report #:	WC705261 Run 3	Test Area:	LTS		
EUT Model #:	MT800SWM	Date:	7/16/2007		
EUT Serial #:	n/a	EUT Power:	60Hz/120VAC	Temperature:	24.0 °C
Test Method:	FCC B			Air Pressure:	98.0 kPa
Customer:	Multi-Tech			Rel. Humidity:	52.0 %
EUT Description:	Serial to wireless ethernet module				
Notes:	5 dBi antenna (long)				
Data File Name:	5261.dat			Page:	3 of 6

Measurement summary for limit2: FCC B >1G 3 M pk (Pk)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA2 FCC B >1G 3 M pk
4.824 GHz	57.0 Pk	7.61 / 32.85 / 40.2 / 0.28	57.54	V / 2.24 / 261	-16.46
4.924 GHz	55.8 Pk	7.64 / 33.05 / 39.9 / 0.0	56.59	V / 2.10 / 317	-17.41
4.874 GHz	53.4 Pk	7.63 / 32.95 / 39.9 / 0.28	54.36	V / 2.17 / 258	-19.64

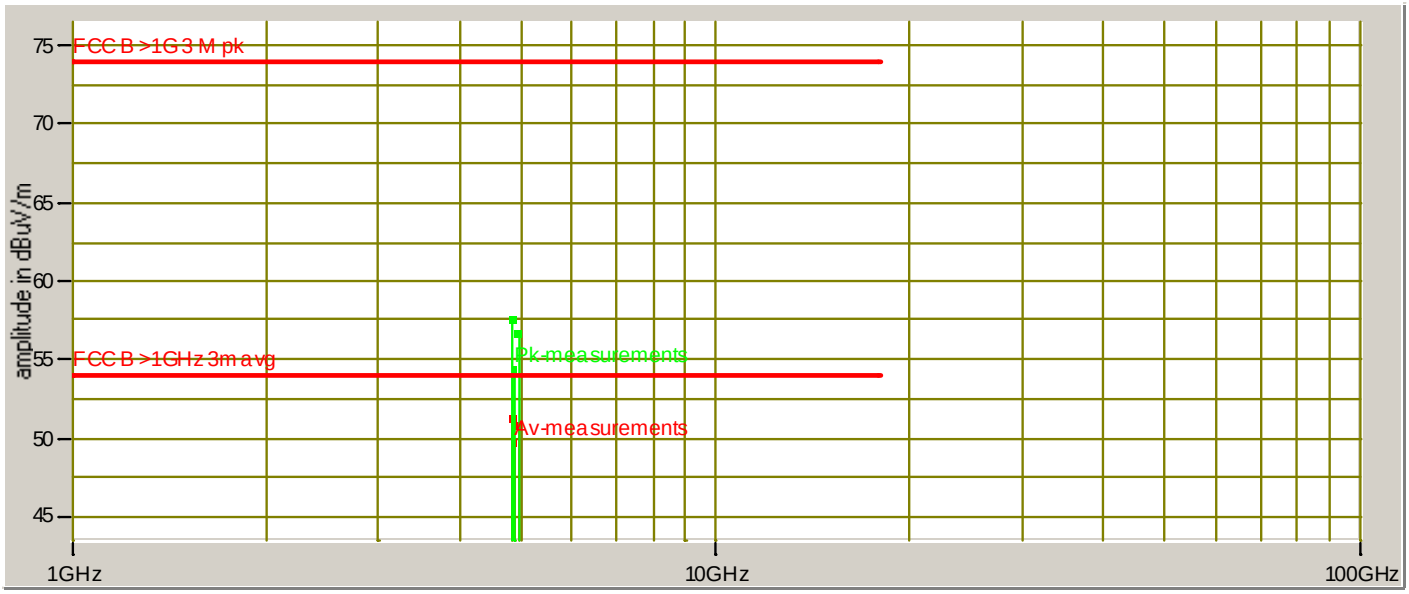
Tested by: Greg Jakubowski — Printed — Signature

Reviewed by: S. L. Rupp — Printed — Signature

RADIATED EMISSIONS

Test Report #:	WC705261 Run 3	Test Area:	LTS		
EUT Model #:	MT800SWM	Date:	7/16/2007		
EUT Serial #:	n/a	EUT Power:	60Hz/120VAC	Temperature:	24.0 °C
Test Method:	FCC B			Air Pressure:	98.0 kPa
Customer:	Multi-Tech			Rel. Humidity:	52.0 %
EUT Description:	Serial to wireless ethernet module				
Notes:	5 dBi antenna (long)				
Data File Name:	5261.dat			Page:	4 of 6

Graph:



Tested by: Greg Jakubowski

Printed

Signature

Reviewed by: S. L. Rupp

Printed

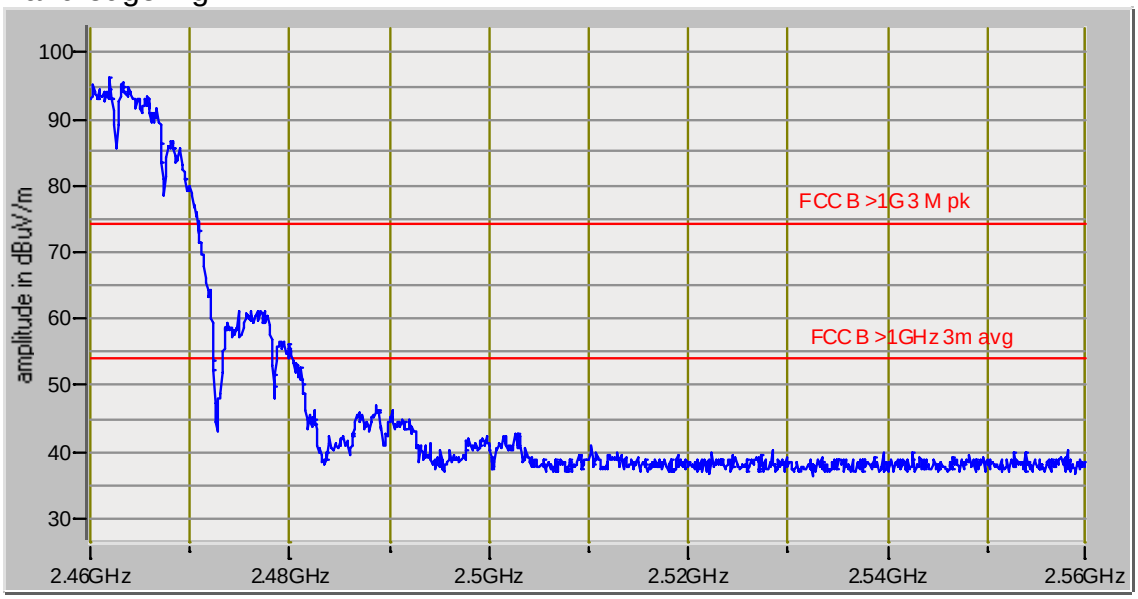
Signature

RADIATED EMISSIONS

Test Report #:	WC705261 Run 3	Test Area:	LTS		
EUT Model #:	MT800SWM	Date:	7/16/2007		
EUT Serial #:	n/a	EUT Power:	60Hz/120VAC	Temperature:	24.0 °C
Test Method:	FCC B			Air Pressure:	98.0 kPa
Customer:	Multi-Tech			Rel. Humidity:	52.0 %
EUT Description:	Serial to wireless ethernet module				
Notes:	5 dBi antenna (long)				
Data File Name:	5261.dat			Page:	5 of 6

Radiated band edge plots
Max hold while maximizing azimuth, polarity, & height

Band edge high



RBW 100 kHz VBW 300 kHz

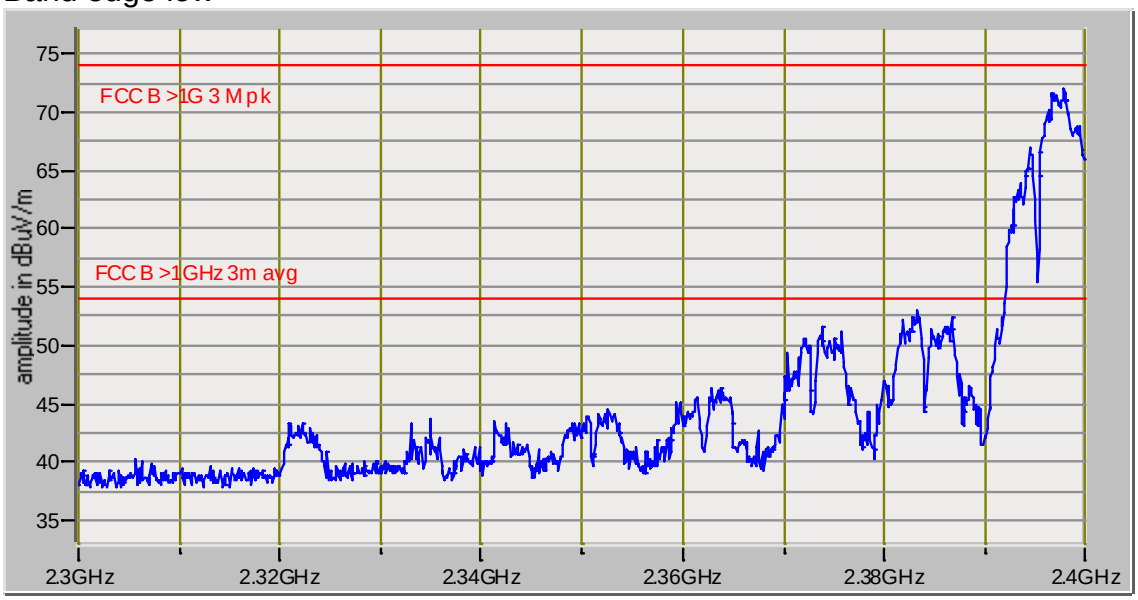
Tested by: Greg Jakubowski — Printed — Signature

Reviewed by: S. L. Rupp — Printed — Signature

RADIATED EMISSIONS

Test Report #:	WC705261 Run 3	Test Area:	LTS		
EUT Model #:	MT800SWM	Date:	7/16/2007		
EUT Serial #:	n/a	EUT Power:	60Hz/120VAC	Temperature:	24.0 °C
Test Method:	FCC B			Air Pressure:	98.0 kPa
Customer:	Multi-Tech			Rel. Humidity:	52.0 %
EUT Description:	Serial to wireless ethernet module				
Notes:	5 dBi antenna (long)				
Data File Name:	5261.dat			Page:	6 of 6

Band edge low



RBW 100 kHz VBW 300 kHz

Tested by: Greg Jakubowski

Printed Signature

Reviewed by: S. L. Rupp

Printed Signature

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

Test summary
The requirements are: ■ - MET ☐ - NOT MET
Maximum power spectral density is –0.17 dBm / 3 kHz.

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

Test equipment

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
3367	E4440A	Agilent	Spectrum Analyzer	MY42510439	14 Sep 07
3844	61697		HF cable		Code B 05 Jan 08

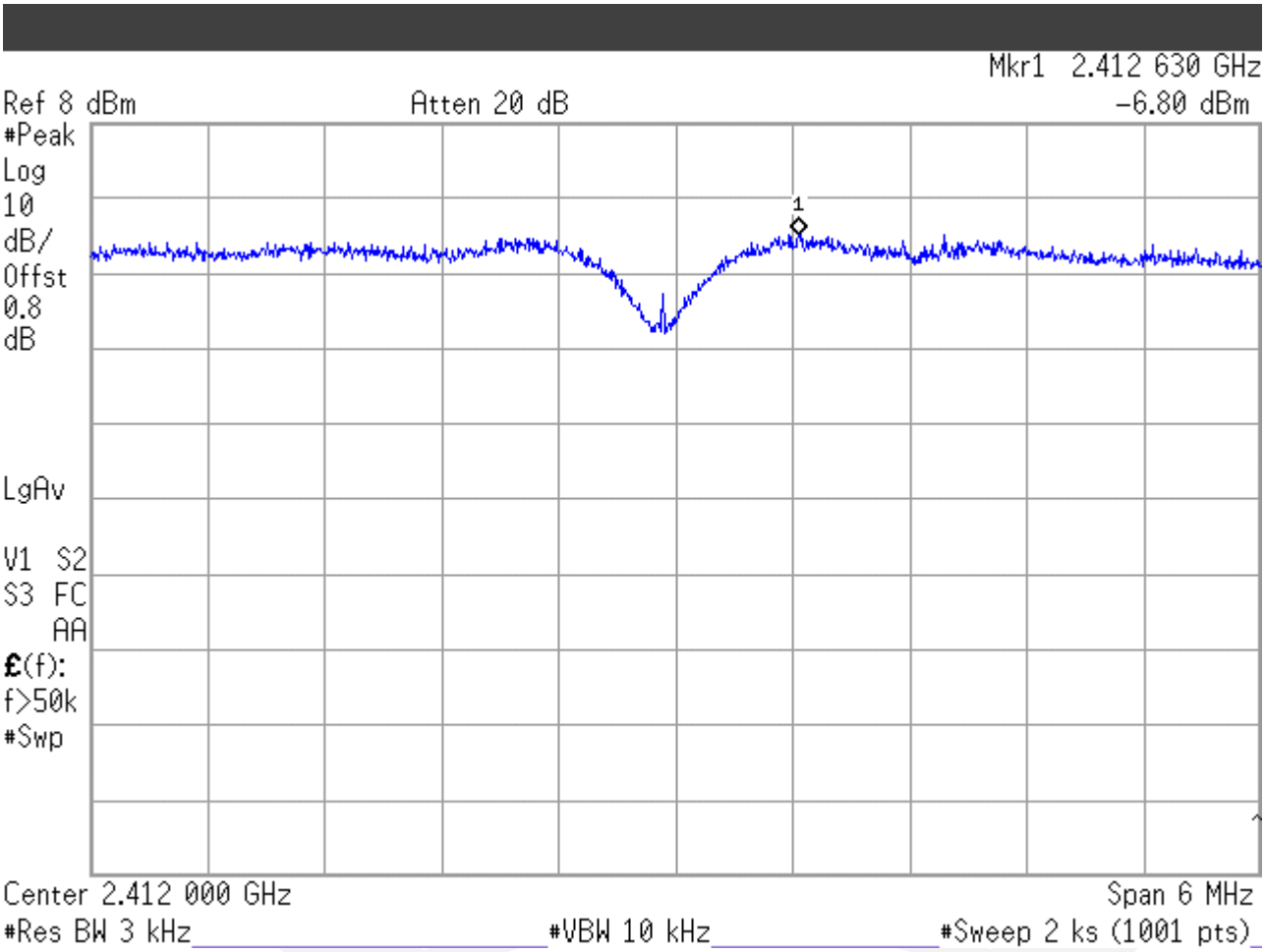
Cal Code B = Calibration verification performed internally.

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

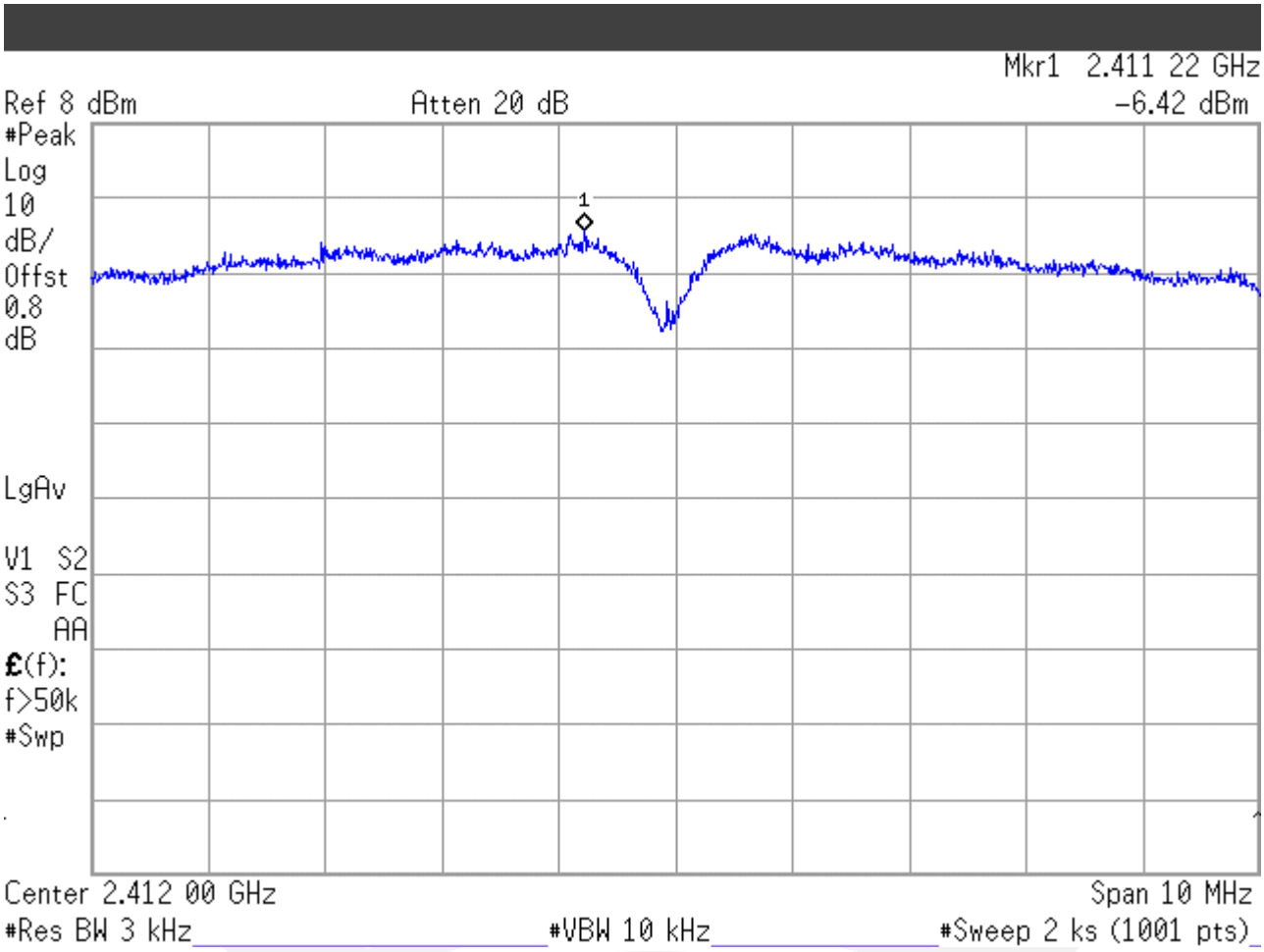
Test data
See following pages.

TÜV AMERICA INC 19333 Wild Mountain Road Taylors Falls MN 55084 Tel: (651) 638-0297 Fax: (651) 638-0298 Rev. 012907

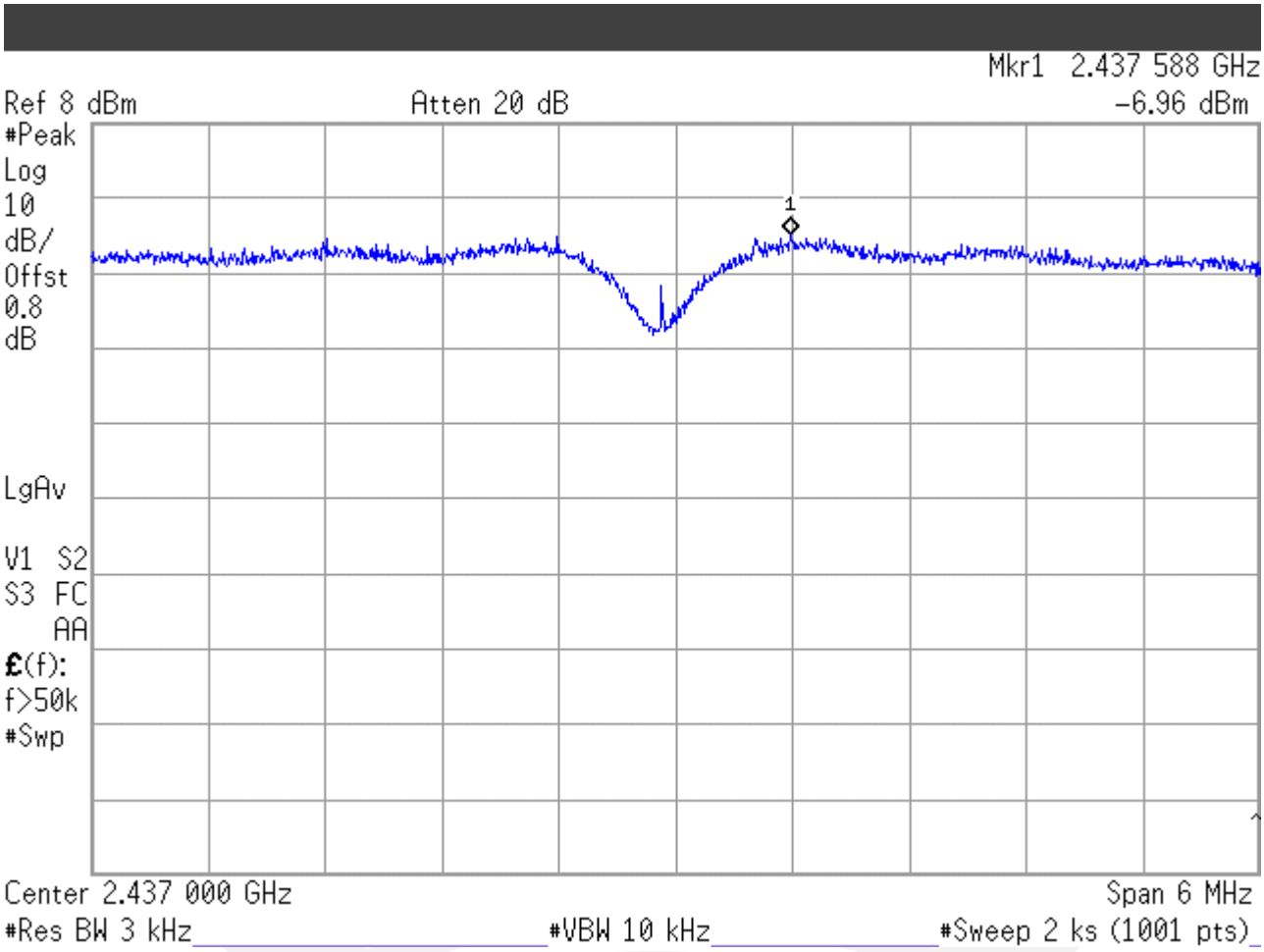
Power spectra density, low channel, 6 MHz span



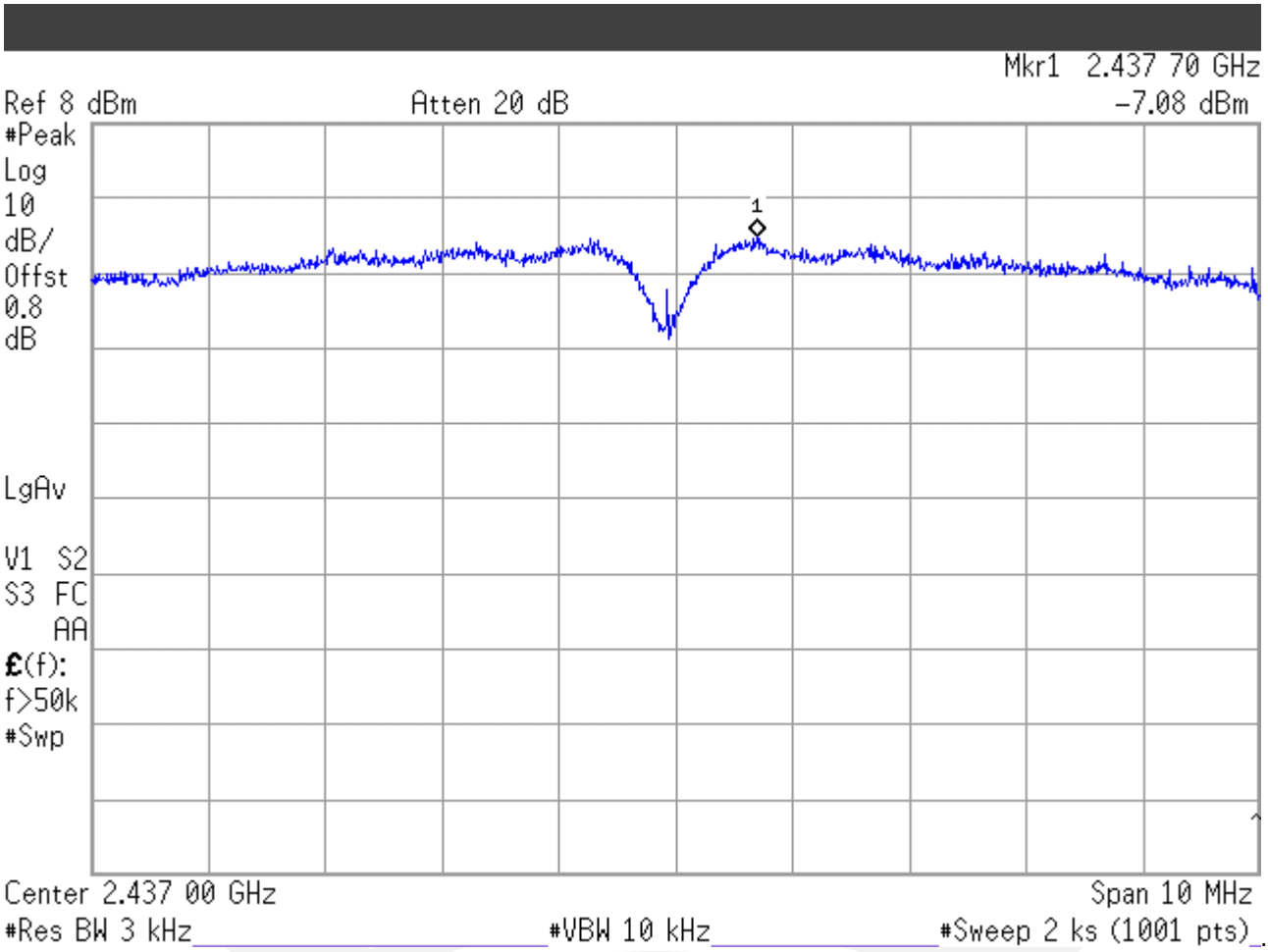
Power spectra density, low channel, 10 MHz span



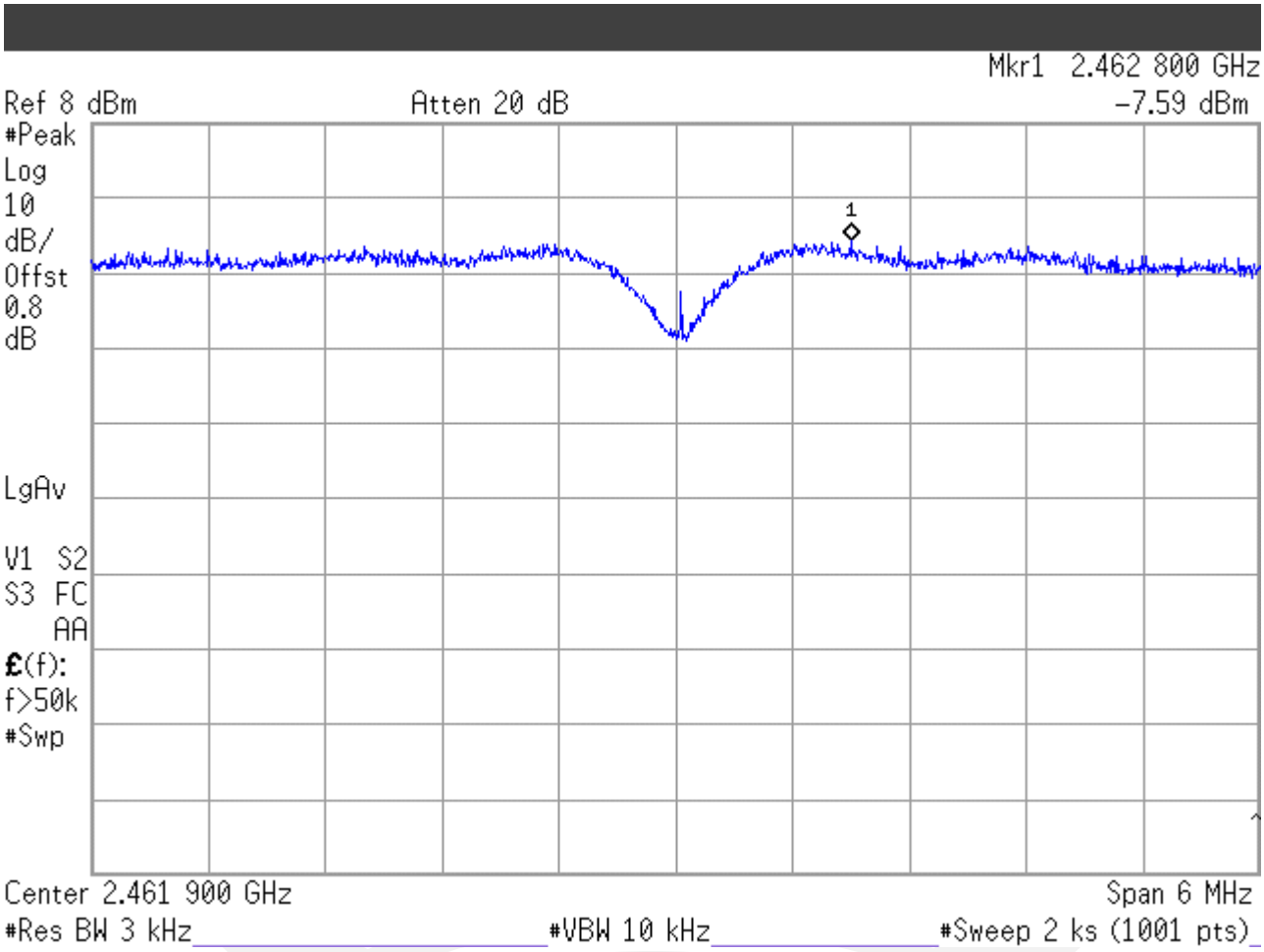
Power spectra density, mid channel, 6 MHz span



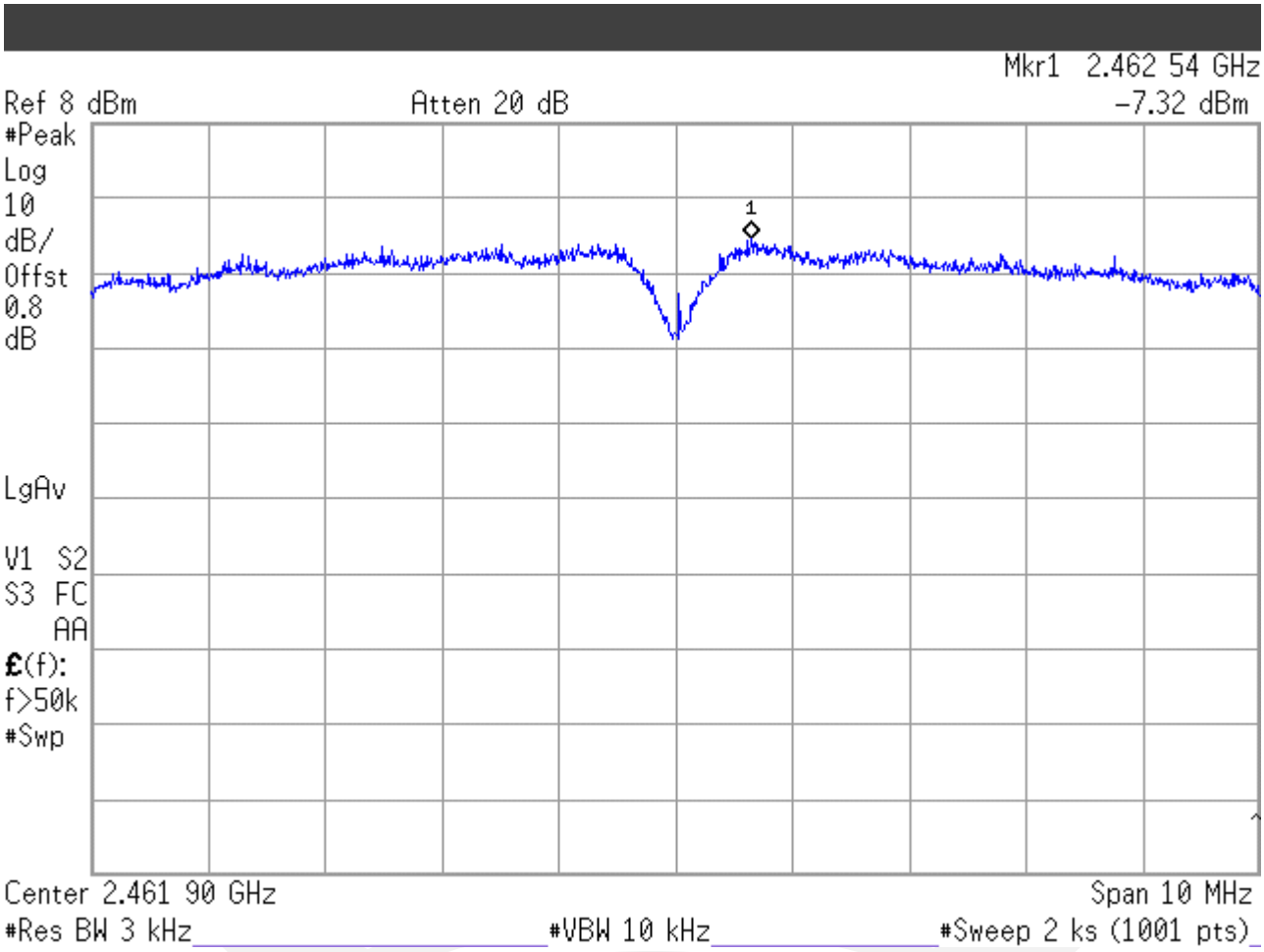
Power spectra density, mid channel, 10 MHz span



Power spectra density, high channel, 6 MHz span



Power spectra density, high channel, 10 MHz span



Conducted limits - AC power lines
FCC 15.207(a), IC RSS-Gen 7.2.2

Test summary
The requirements are: ■ - MET ☐ - NOT MET
Minimum margin of compliance is 8.0 dB at 855 kHz

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 Shield Room 2

Test equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Due
2416	3825/2	Electro-Mechanics (EMCO)	50 Ω LISN	8812-1437	Code B 11-Jan-08
2534	ESHS-20	Rhode & Schwarz	EMI Receiver	837055/003	22-Mar-08

Cal Code B = Calibration verification performed internally.

Test limit

Frequncy (MHz)	Quasi peak (dBμV/m)	Average (dBμV/m)
0.15 - 0.5	66 to 56*	56 to 46*
0.5 - 5	56	46
5 - 30	60	50

*Decreases with the logarithm of the frequency.

Test data
See following pages.

TÜV AMERICA INC 19333 Wild Mountain Road Taylors Falls MN 55084 Tel: (651) 638-0297 Fax: (651) 638-0298 Rev. 012907

CONDUCTED EMISSIONS

Test Report #:	WC705261 Run 5	Test Area:	SR2		
EUT Model #:	MT800SWM	Date:	9/18/07		
EUT Serial #:	n/a	EUT Power:	110V/60Hz, 230V/50Hz	Temperature:	22.0 °C
Test Method:	FCC 15.207, EN55022 B			Air Pressure:	98.0 kPa
Customer:	Multi-Tech			Rel. Humidity:	61.0 %
EUT Description:	Serial to wireless ethernet module				
Notes:					
Data File Name:	5261.dat			Page:	1 of 6

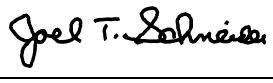
List of measurements for run #: 5

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	EUT Lead	DELTA1 EN55022 B Qp	DELTA2 EN55022 B Avg
110V, 60Hz						
150.0 kHz	57.11 Qp	0.02 / 0.3 / 0.0 / 0.0	57.43	L1	-8.57	n/a
220.0 kHz	45.41 Qp	0.03 / 0.11 / 0.0 / 0.0	45.55	L1	-17.27	n/a
290.0 kHz	37.73 Qp	0.03 / 0.1 / 0.0 / 0.0	37.86	L1	-22.66	n/a
365.0 kHz	35.83 Qp	0.04 / 0.1 / 0.0 / 0.0	35.97	L1	-22.64	n/a
14.855 MHz	20.03 Qp	0.33 / 0.25 / 0.0 / 0.0	20.61	L1	-39.39	n/a
17.695 MHz	24.41 Qp	0.35 / 0.28 / 0.0 / 0.0	25.04	L1	-34.96	n/a
150.0 kHz	41.14 Av	0.02 / 0.3 / 0.0 / 0.0	41.46	L1	n/a	-14.54
220.0 kHz	30.57 Av	0.03 / 0.11 / 0.0 / 0.0	30.71	L1	n/a	-22.11
290.0 kHz	28.69 Av	0.03 / 0.1 / 0.0 / 0.0	28.82	L1	n/a	-21.7
365.0 kHz	29.77 Av	0.04 / 0.1 / 0.0 / 0.0	29.91	L1	n/a	-18.7
14.855 MHz	13.54 Av	0.33 / 0.25 / 0.0 / 0.0	14.12	L1	n/a	-35.88
17.695 MHz	18.53 Av	0.35 / 0.28 / 0.0 / 0.0	19.16	L1	n/a	-30.84
150.0 kHz	56.67 Qp	0.02 / 0.3 / 0.0 / 0.0	56.99	N	-9.01	n/a
220.0 kHz	45.39 Qp	0.03 / 0.11 / 0.0 / 0.0	45.53	N	-17.29	n/a
290.0 kHz	36.85 Qp	0.03 / 0.1 / 0.0 / 0.0	36.98	N	-23.54	n/a
365.0 kHz	32.41 Qp	0.04 / 0.1 / 0.0 / 0.0	32.55	N	-26.06	n/a
14.855 MHz	20.23 Qp	0.33 / 0.25 / 0.0 / 0.0	20.81	N	-39.19	n/a
17.695 MHz	25.19 Qp	0.35 / 0.28 / 0.0 / 0.0	25.82	N	-34.18	n/a
150.0 kHz	41.39 Av	0.02 / 0.3 / 0.0 / 0.0	41.71	N	n/a	-14.29
220.0 kHz	30.4 Av	0.03 / 0.11 / 0.0 / 0.0	30.54	N	n/a	-22.28
290.0 kHz	25.43 Av	0.03 / 0.1 / 0.0 / 0.0	25.56	N	n/a	-24.96
365.0 kHz	27.4 Av	0.04 / 0.1 / 0.0 / 0.0	27.54	N	n/a	-21.07
14.855 MHz	14.26 Av	0.33 / 0.25 / 0.0 / 0.0	14.84	N	n/a	-35.16

Tested by: Greg Jakubowski — Printed

 — Signature

Reviewed by: J. T. Schneider — Printed

 — Signature

CONDUCTED EMISSIONS

Test Report #:	WC705261 Run 5	Test Area:	SR2		
EUT Model #:	MT800SWM	Date:	9/18/07		
EUT Serial #:	n/a	EUT Power:	110V/60Hz, 230V/50Hz	Temperature:	22.0 °C
Test Method:	FCC 15.207, EN55022 B			Air Pressure:	98.0 kPa
Customer:	Multi-Tech			Rel. Humidity:	61.0 %
EUT Description:	Serial to wireless ethernet module				
Notes:					
Data File Name:	5261.dat			Page:	2 of 6

List of measurements for run #: 5

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	EUT Lead	DELTA1 EN55022 B Qp	DELTA2 EN55022 B Avg
17.695 MHz	19.25 Av	0.35 / 0.28 / 0.0 / 0.0	19.88	N	n/a	-30.12
230V, 50 Hz						
150.0 kHz	41.87 Qp	0.02 / 0.3 / 0.0 / 0.0	42.19	L1	-23.81	n/a
175.0 kHz	38.43 Qp	0.02 / 0.23 / 0.0 / 0.0	38.68	L1	-26.04	n/a
285.0 kHz	45.15 Qp	0.03 / 0.1 / 0.0 / 0.0	45.28	L1	-15.39	n/a
855.0 kHz	38.13 Qp	0.1 / 0.1 / 0.0 / 0.0	38.33	L1	-17.67	n/a
15.025 MHz	34.97 Qp	0.33 / 0.25 / 0.0 / 0.0	35.55	L1	-24.45	n/a
17.7 MHz	36.43 Qp	0.35 / 0.28 / 0.0 / 0.0	37.06	L1	-22.94	n/a
150.0 kHz	11.34 Av	0.02 / 0.3 / 0.0 / 0.0	11.66	L1	n/a	-44.34
175.0 kHz	10.15 Av	0.02 / 0.23 / 0.0 / 0.0	10.4	L1	n/a	-44.32
285.0 kHz	39.74 Av	0.03 / 0.1 / 0.0 / 0.0	39.87	L1	n/a	-10.8
855.0 kHz	37.77 Av	0.1 / 0.1 / 0.0 / 0.0	37.97	L1	n/a	-8.03
15.025 MHz	33.66 Av	0.33 / 0.25 / 0.0 / 0.0	34.24	L1	n/a	-15.76
17.7 MHz	34.55 Av	0.35 / 0.28 / 0.0 / 0.0	35.18	L1	n/a	-14.82
150.0 kHz	41.83 Qp	0.02 / 0.3 / 0.0 / 0.0	42.15	N	-23.85	n/a
175.0 kHz	38.75 Qp	0.02 / 0.23 / 0.0 / 0.0	39.0	N	-25.72	n/a
285.0 kHz	40.83 Qp	0.03 / 0.1 / 0.0 / 0.0	40.96	N	-19.71	n/a
855.0 kHz	37.63 Qp	0.1 / 0.1 / 0.0 / 0.0	37.83	N	-18.17	n/a
15.025 MHz	34.83 Qp	0.33 / 0.25 / 0.0 / 0.0	35.41	N	-24.59	n/a
17.7 MHz	37.01 Qp	0.35 / 0.28 / 0.0 / 0.0	37.64	N	-22.36	n/a
150.0 kHz	11.53 Av	0.02 / 0.3 / 0.0 / 0.0	11.85	N	n/a	-44.15
175.0 kHz	10.15 Av	0.02 / 0.23 / 0.0 / 0.0	10.4	N	n/a	-44.32
285.0 kHz	35.93 Av	0.03 / 0.1 / 0.0 / 0.0	36.06	N	n/a	-14.61

Tested by: Greg Jakubowski — Printed — Signature

Reviewed by: J. T. Schneider — Printed — Signature

CONDUCTED EMISSIONS

Test Report #:	WC705261 Run 5	Test Area:	SR2		
EUT Model #:	MT800SWM	Date:	9/18/07		
EUT Serial #:	n/a	EUT Power:	110V/60Hz, 230V/50Hz	Temperature:	22.0 °C
Test Method:	FCC 15.207, EN55022 B			Air Pressure:	98.0 kPa
Customer:	Multi-Tech			Rel. Humidity:	61.0 %
EUT Description:	Serial to wireless ethernet module				
Notes:					
Data File Name:	5261.dat			Page:	3 of 6

List of measurements for run #: 5

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	EUT Lead	DELTA1 EN55022 B Qp	DELTA2 EN55022 B Avg
855.0 kHz	37.24 Av	0.1 / 0.1 / 0.0 / 0.0	37.44	N	n/a	-8.56
15.025 MHz	32.92 Av	0.33 / 0.25 / 0.0 / 0.0	33.5	N	n/a	-16.5
17.7 MHz	35.56 Av	0.35 / 0.28 / 0.0 / 0.0	36.19	N	n/a	-13.81

Tested by: Greg Jakubowski — Printed — Signature

Reviewed by: J. T. Schneider — Printed — Signature

CONDUCTED EMISSIONS

Test Report #:	WC705261 Run 5	Test Area:	SR2		
EUT Model #:	MT800SWM	Date:	9/18/07		
EUT Serial #:	n/a	EUT Power:	110V/60Hz, 230V/50Hz	Temperature:	22.0 °C
Test Method:	FCC 15.207, EN55022 B			Air Pressure:	98.0 kPa
Customer:	Multi-Tech			Rel. Humidity:	61.0 %
EUT Description:	Serial to wireless ethernet module				
Notes:					
Data File Name:	5261.dat			Page:	4 of 6

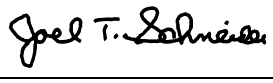
Measurement summary for limit1: EN55022 B Qp (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	EUT Lead	DELTA1 EN55022 B Qp
150.0 kHz	57.11 Qp	0.02 / 0.3 / 0.0 / 0.0	57.43	L1	-8.57
285.0 kHz	45.15 Qp	0.03 / 0.1 / 0.0 / 0.0	45.28	L1	-15.39
220.0 kHz	45.41 Qp	0.03 / 0.11 / 0.0 / 0.0	45.55	L1	-17.27
855.0 kHz	38.13 Qp	0.1 / 0.1 / 0.0 / 0.0	38.33	L1	-17.67
17.7 MHz	37.01 Qp	0.35 / 0.28 / 0.0 / 0.0	37.64	N	-22.36
365.0 kHz	35.83 Qp	0.04 / 0.1 / 0.0 / 0.0	35.97	L1	-22.64
15.025 MHz	34.97 Qp	0.33 / 0.25 / 0.0 / 0.0	35.55	L1	-24.45
175.0 kHz	38.75 Qp	0.02 / 0.23 / 0.0 / 0.0	39.0	N	-25.72
14.855 MHz	20.23 Qp	0.33 / 0.25 / 0.0 / 0.0	20.81	N	-39.19

Tested by: Greg Jakubowski — Printed

 — Signature

Reviewed by: J. T. Schneider — Printed

 — Signature

CONDUCTED EMISSIONS

Test Report #:	WC705261 Run 5	Test Area:	SR2			
EUT Model #:	MT800SWM	Date:	9/18/07			
EUT Serial #:	n/a	EUT Power:	110V/60Hz, 230V/50Hz	Temperature:	22.0	°C
Test Method:	FCC 15.207, EN55022 B			Air Pressure:	98.0	kPa
Customer:	Multi-Tech			Rel. Humidity:	61.0	%
EUT Description:	Serial to wireless ethernet module					
Notes:						
Data File Name:	5261.dat			Page:	5 of 6	

Measurement summary for limit2: EN55022 B Avg (Av)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	EUT Lead	DELTA2 EN55022 B Avg
855.0 kHz	37.77 Av	0.1 / 0.1 / 0.0 / 0.0	37.97	L1	-8.03
285.0 kHz	39.74 Av	0.03 / 0.1 / 0.0 / 0.0	39.87	L1	-10.8
17.7 MHz	35.56 Av	0.35 / 0.28 / 0.0 / 0.0	36.19	N	-13.81
150.0 kHz	41.39 Av	0.02 / 0.3 / 0.0 / 0.0	41.71	N	-14.29
15.025 MHz	33.66 Av	0.33 / 0.25 / 0.0 / 0.0	34.24	L1	-15.76
365.0 kHz	29.77 Av	0.04 / 0.1 / 0.0 / 0.0	29.91	L1	-18.7
220.0 kHz	30.57 Av	0.03 / 0.11 / 0.0 / 0.0	30.71	L1	-22.11
14.855 MHz	14.26 Av	0.33 / 0.25 / 0.0 / 0.0	14.84	N	-35.16
175.0 kHz	10.15 Av	0.02 / 0.23 / 0.0 / 0.0	10.4	L1	-44.32

Tested by: Greg Jakubowski — Printed

G Jakubowski — Signature

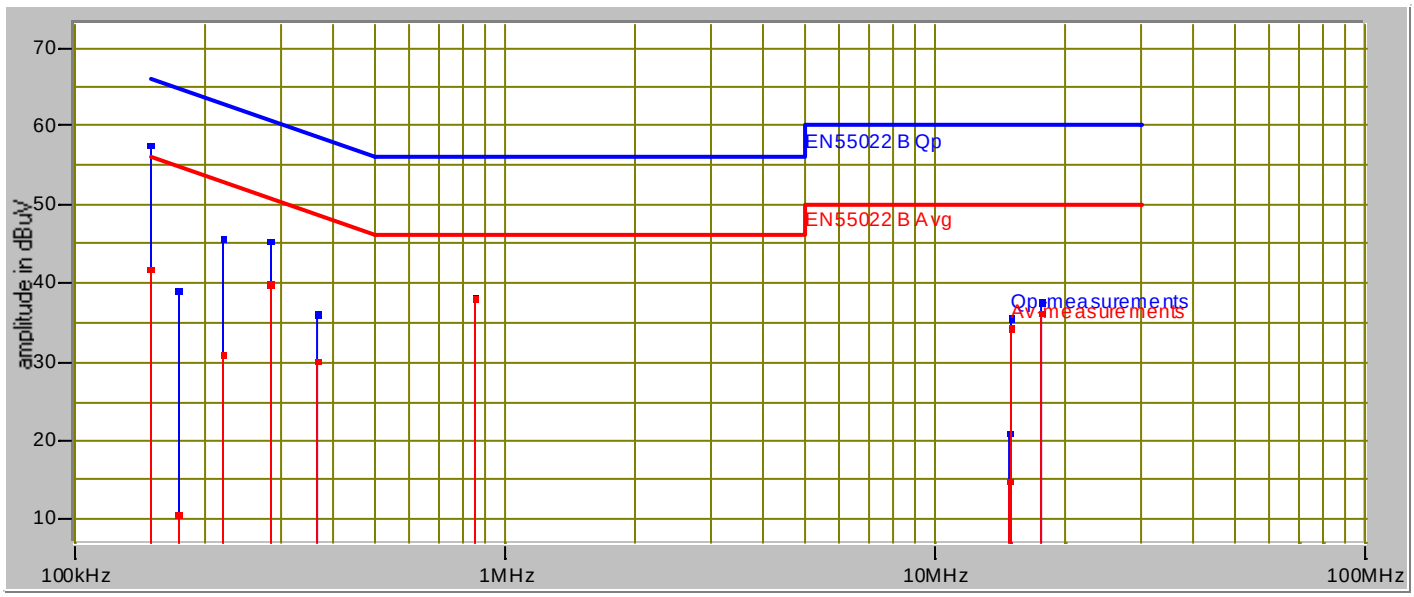
Reviewed by: J. T. Schneider — Printed

Joel T. Schneider — Signature

CONDUCTED EMISSIONS

Test Report #:	WC705261 Run 5	Test Area:	SR2		
EUT Model #:	MT800SWM	Date:	9/18/07		
EUT Serial #:	n/a	EUT Power:	110V/60Hz, 230V/50Hz	Temperature:	22.0 °C
Test Method:	FCC 15.207, EN55022 B			Air Pressure:	98.0 kPa
Customer:	Multi-Tech			Rel. Humidity:	61.0 %
EUT Description:	Serial to wireless ethernet module				
Notes:					
Data File Name:	5261.dat			Page:	6 of 6

Graph:



Tested by: Greg Jakubowski

Printed | Signature

Reviewed by: J. T. Schneider

Printed | Signature

TEST SETUP FOR EMISSIONS TESTING

WILD RIVER LAB
Large Test Site

Notes:

1. Items shown in dotted lines are located on the floor below the test area. It is 5 meters vertically from the ground floor to the test area.

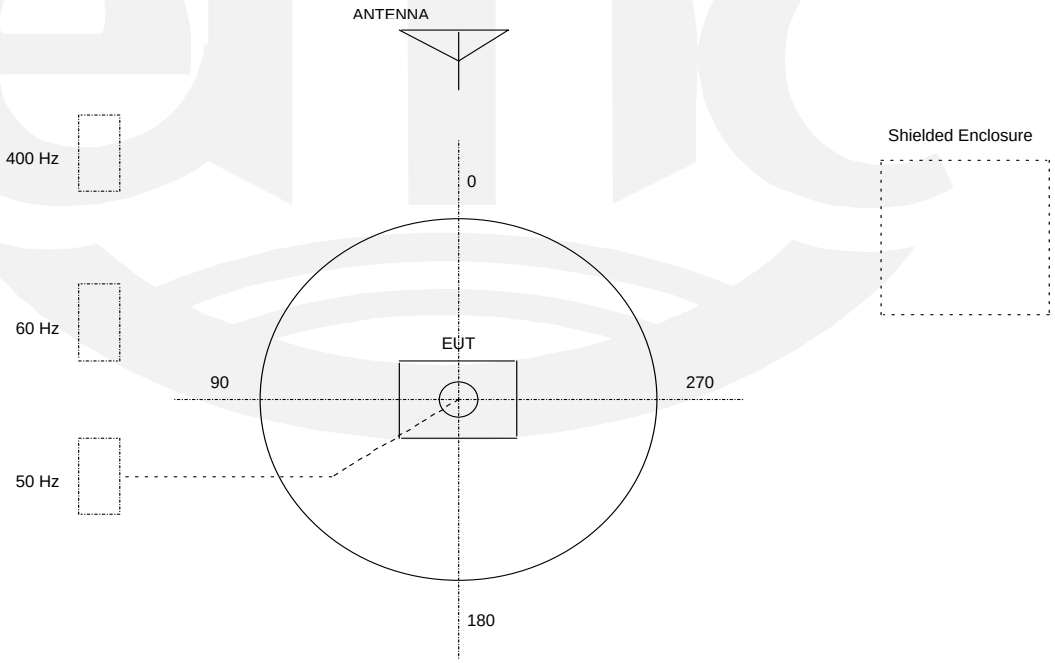
2. 50 Hz, 60 Hz, and 400 Hz are power panels for alternating current.

3. The antenna may be positioned horizontally 3, 10 or 30 meters from the center of the turntable.

4. The circle is a 6.7 meter diameter turntable.

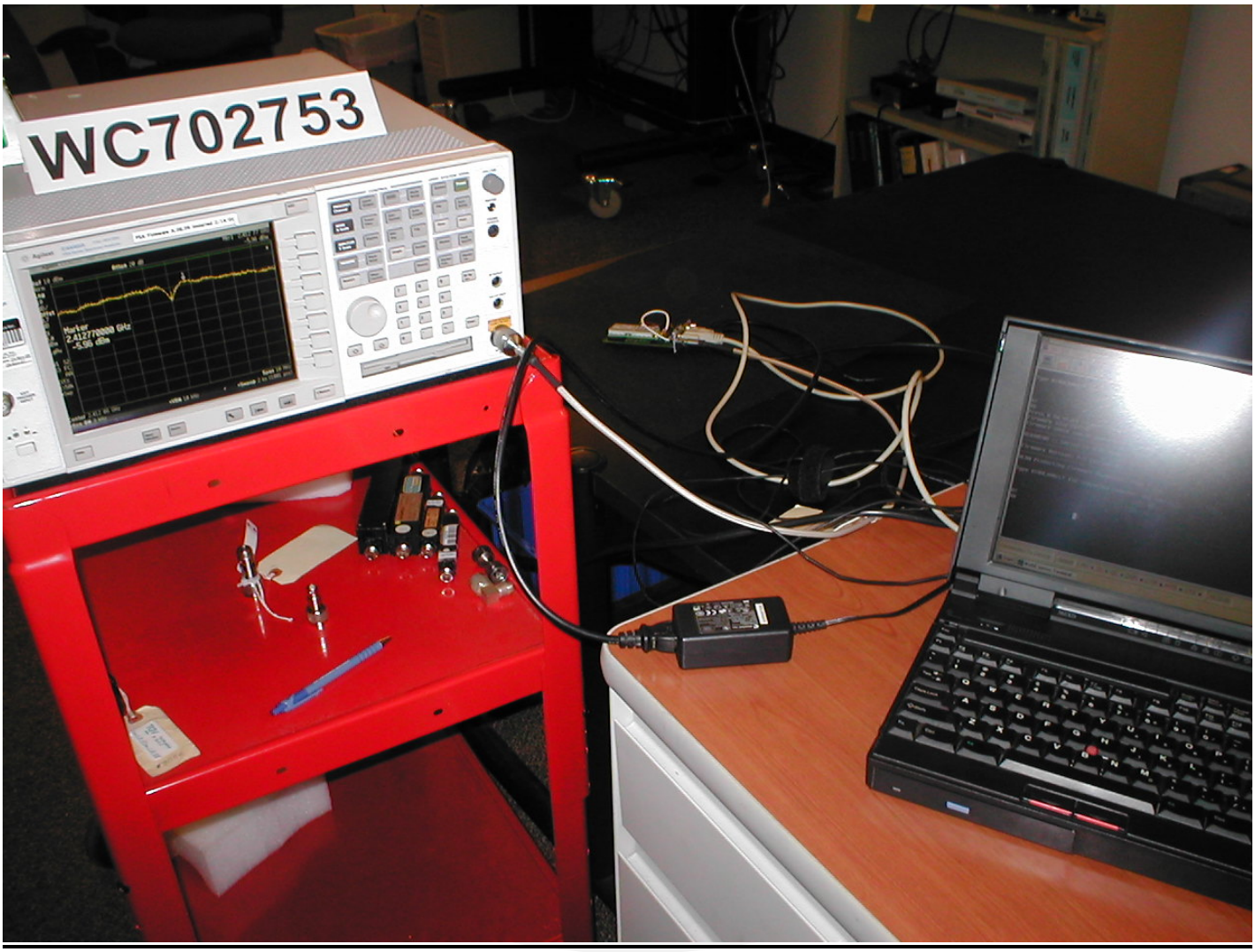
5. A ground plane is in the plane of this sheet.

6. The test sample is shown in the azimuthal position representing zero degrees.



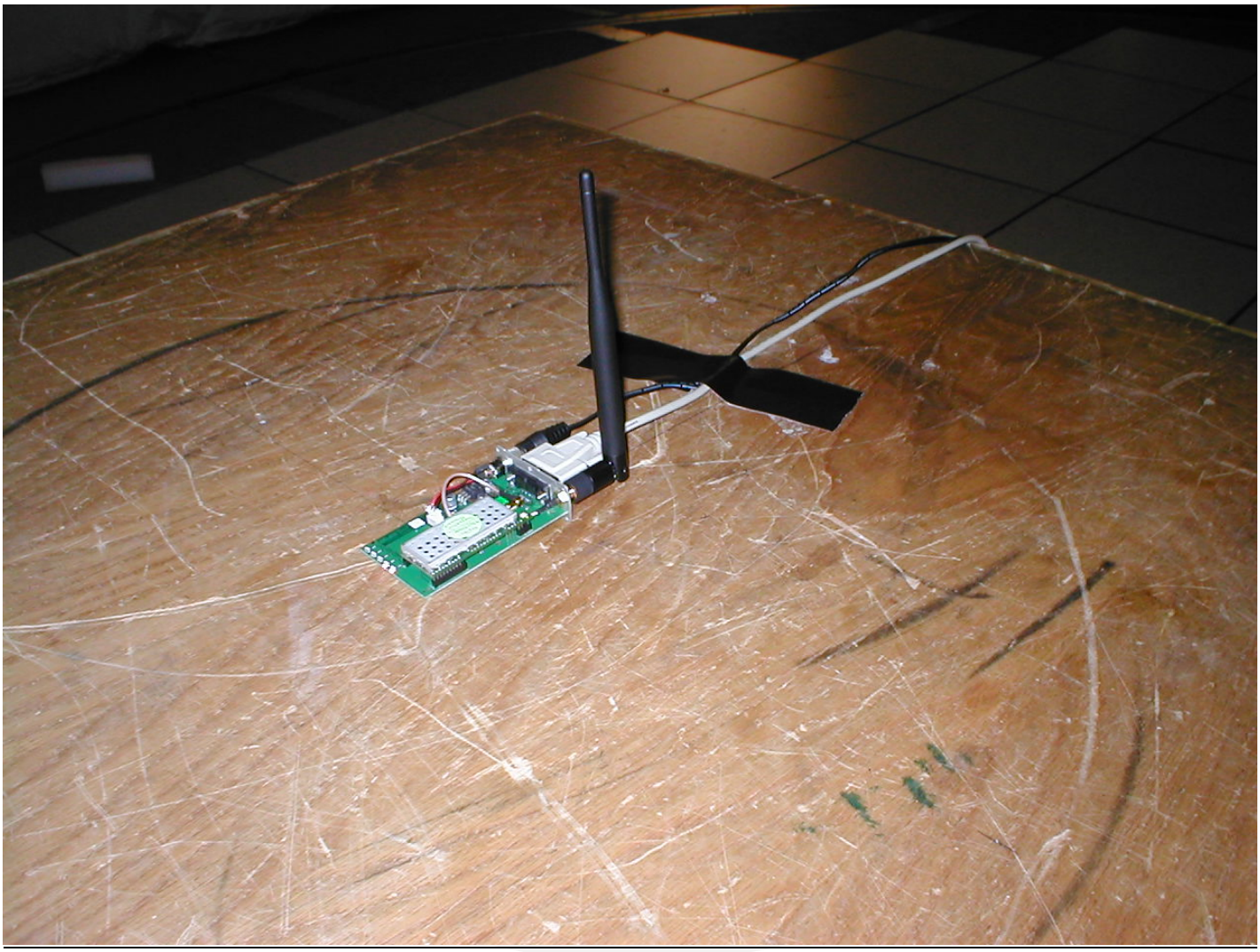
TÜV AMERICA INC 19333 Wild Mountain Road Taylors Falls MN 55084 Tel: (651) 638-0297 Fax: (651) 638-0298 Rev. 012907

Test-setup photo(s):
RF conducted emissions



TÜV AMERICA INC 19333 Wild Mountain Road Taylors Falls MN 55084 Tel: (651) 638-0297 Fax: (651) 638-0298 Rev. 012907

Test-setup photo(s):
Radiated emissions



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Test-setup photo(s):
Radiated emissions

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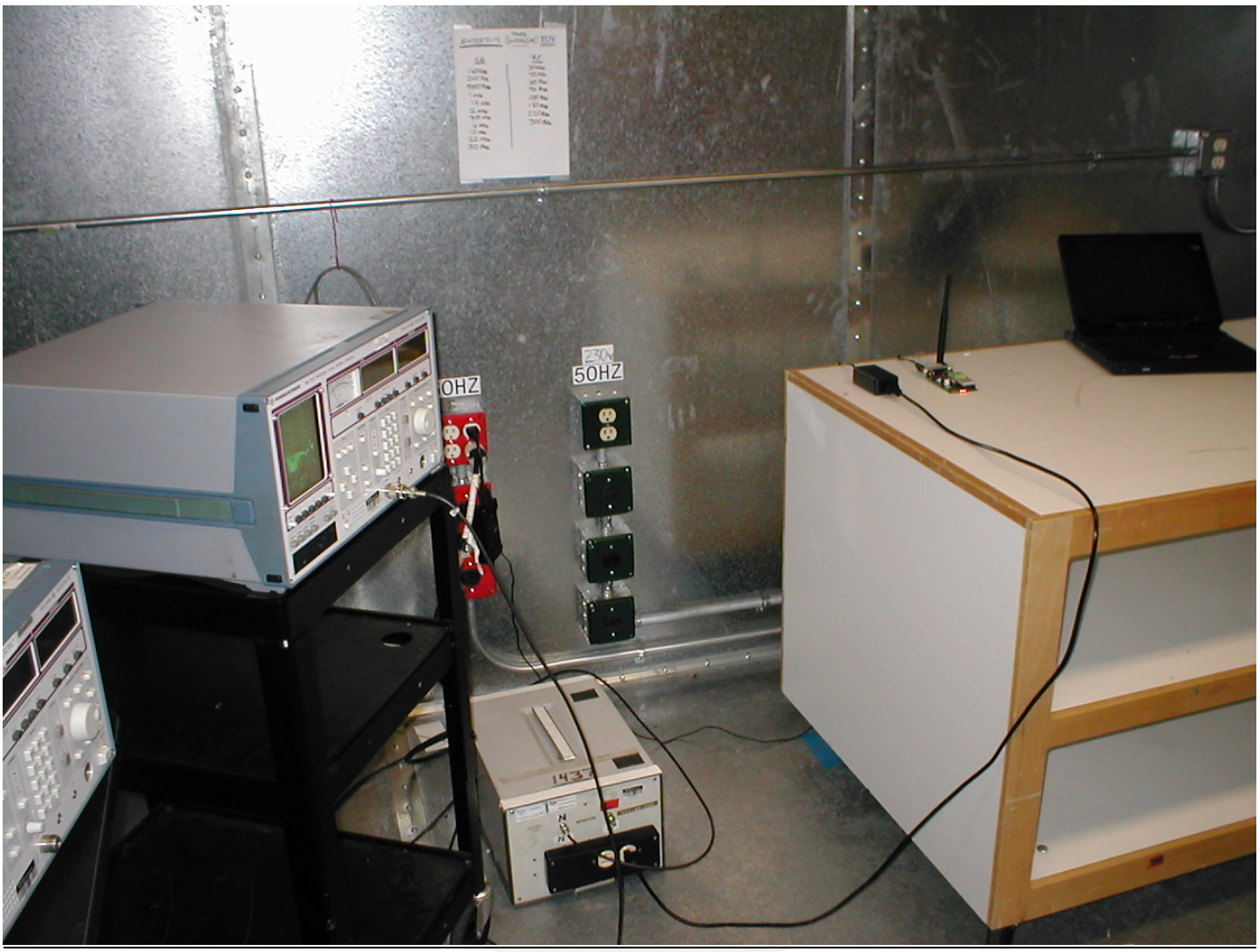
Test-setup photo(s):
Conducted limits - AC power lines



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Equipment Under Test (EUT) Test Operation Mode:

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

☐ - Standby

☐ - Test program (H - Pattern)

☐ - Test program (color bar)

☐ - Test program (customer specific)

☐ - Practice operation

☐ - Normal operating mode

■ - Typical operating mode: EUT connected on-line through access point device to another MT800SWM wireless device. Serial data (H's) passed continuously between the two units.

■ - Transmitter test mode: Special commands issued to EUT to set transmitter power and frequency (high, middle, low) as required per standard for transmitter testing.

Configuration of the device under test:

■ - See Appendix B and test setup photo(s)

☐ - See Product Information Form(s) in Appendix B

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DEVIATIONS FROM STANDARD:
None.

GENERAL REMARKS:
Some radiated emissions data is from previous testing under file number WC700538

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 device under test does fulfill the general approval requirements.
☐ - **not** met and the device under test does **not** fulfill the general approval requirements..

EUT Received Date: 01 February 2007

Condition of EUT: Normal

Testing Start Date: 01 February 2007

Testing End Date: 18 September 2007

TÜV AMERICA INC

Greg Jakubowski
Senior EMC Technician

Joel Schneider
Senior EMC Engineer

TÜV AMERICA INC 19333 Wild Mountain Road Taylors Falls MN 55084 Tel: (651) 638-0297 Fax: (651) 638-0298 Rev. 012907

Appendix A

Constructional Data Form

and

Block Diagram

TÜV AMERICA INC 19333 Wild Mountain Road Taylors Falls MN 55084 Tel: (651) 638-0297 Fax: (651) 638-0298 Rev. 012907

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: MultiTech Systems Inc.

Address: 2205 Woodale Drive
Mounds View, MN 55112

Contact: Bud Sundeen Position: Quality Manager

Phone: 763-717-5516 Fax: 763-785-9874

E-mail Address: msundeen@multitech.com

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

EUT Description: WLAN to Serial Module

EUT Name:

Model No.: MT800SWM Serial No.: N/A

Product Options: N/A

Configurations to be tested: Typical

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: none

Modifications made during test: none

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

- ☒ EMC Directive 89/336/EEC (EMC) Std:
- ☐ Machinery Directive 89/392/EEC (EMC Std:
- ☐ Medical Device Directive 93/42/EEC (EMC) Std:
- ☐ Vehicle Directive 72/245/EEC (EMC) Std:
- ☐ FDA Reviewers Guidance for Premarket Notification Submissions (EMC)

- ☒ FCC: Class ☐ A ☒ B Part
- ☐ VCCI: Class ☐ A ☐ B
- ☐ BSMI: Class ☐ A ☐ B
- ☒ Canada: Class ☐ A ☒ B
- ☐ Australia: Class ☐ A ☐ B
- ☐ Other:

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

- ☐ Attestation of Conformity (AoC)*
- ☐ Certificate of Conformity (CoC)*
- 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
- ☐ E-Mark Certification
- ☐ EMC Certification (used with Octagon Mark)*
- ☐ Compliance Document*
- ☐ Industry Canada / FCB Certification
- ☐ Taiwan Certification

Form

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: _____ Width: _____ Height: _____ 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: 230/115 (If battery powered, make sure battery life is sufficient to complete testing.)

# of Phases: 1

Current (Amps/phase(max)): 1 Current (Amps/phase(nominal)): 1

Other _____

Other Special Requirements

Typical Installation and/or Operating Environment

(ie. Hospital, Small Business, Industrial/Factory, etc.)
EUT tested on developer's card. The module is intended for OEM integration and will only function when designed into a final product.

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

EMC Test Plan and Constructional Data Form

EUT Software.

Revision Level: Windows XP

Description: Hyperterminal serial communtications via COM port.

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 SÜD America Representative if additional assistance is required.

1. Typical operating mode: EUT connected on-line through access point device to another MT800SWM wireless device. Serial data (H's) passed continuiously between the two units.

2. Transmitter test mode: Special commands issued to EUT to set transmitter power and frequency (high, middle, low) as required per standard for transmitter testing.

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 #
Computer	Dell Dimension B110	J7NXG91	n/a
Monitor	Dell E153FPb	n/a	n/a
Keyboard	HP KB0228	CF33020067	n/a
Mouse	HP S34	5182-5504	n/a
Test card	MTS2BTA	n/a	n/a
Power Supply for test card	Globtek GT21089-1509-T3	n/a	n/a

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 #*
Laptop	ThinkPad 365XD	78-WRM20 96/09	ANOKAJIPENCP
Access Point	RF802EW	7589034	AU792U01E04510

Oscillator Frequencies

Frequency	*Derived Frequency*	*Component # / Location*	*Description of Use*
44.0 MHz		EUT main	uProc
14.7456 MHz		EUT main	uProc

Power Supply

Manufacturer	*Model #*	*Serial #*	*Type*
Globtek	GT21089-1509-T3	N/A	☒ Switched-mode: (Frequency) 100KHz ☐ Linear ☐ Other:
			☐ Switched-mode: (Frequency) _____ ☐ Linear ☐ Other: _____

Power Line Filters

Manufacturer	*Model #*	*Location in EUT*
n/a		

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.

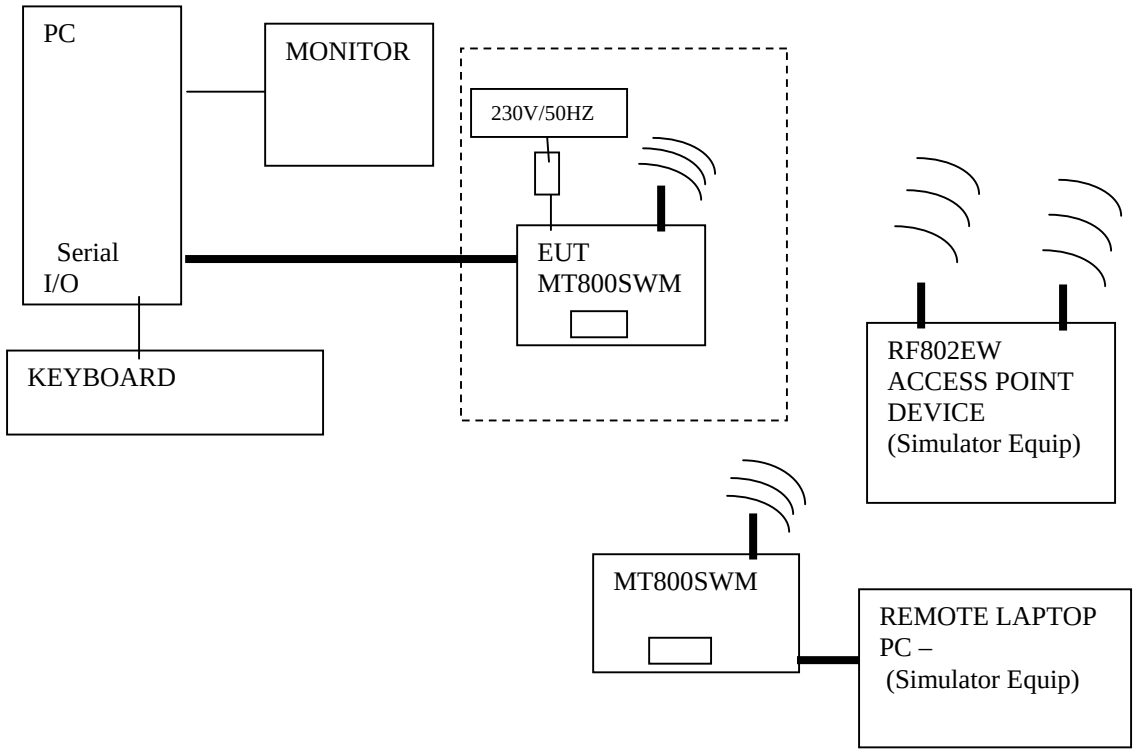
(PLEASE INSERT "**ELECTRONIC SIGNATURE**" BELOW IF POSSIBLE)

Authorization Signatures (Signature Required for Certifications checked on pg 1)

JA	
Customer authorization to perform tests according to this test plan.	Date
JIM ASP	February 19, 2007
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.



EMC Block Diagram Form

Authorization Signatures

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Appendix B

Measurement Protocol

TÜV AMERICA INC 19333 Wild Mountain Road Taylors Falls MN 55084 Tel: (651) 638-0297 Fax: (651) 638-0298 Rev. 012907

MEASUREMENT PROTOCOL

GENERAL INFORMATION

Test Methodology

Emissions testing is performed according to the procedures in ANSI C63.4-2003.

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

The final level, in dBμV, equals the EMI receiver level plus the cable loss and LISN factor.

Radiated Emissions

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 sheets in Attachment A. 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

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Test Equipment

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

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