TEST RESULT SUMMARY

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

MANUFACTURER	Digi International 11001 Bren Road East Minnetonka MN 55343
DESCRIPTION OF EQUIPMENT	USB/Ethernet 10/100 Base T/WLAN Transceiver
NAME OF EQUIPMENT	Caterpillar 802.11 a/b/g Radio
MODEL NUMBER(S) TESTED	50001520-01
TEST REPORT NUMBER	WC903868
TEST DATE(S)	20 July 2008 – 11 June 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",* Section 15.207 *"Conducted Limits",* and Industry Canada RSS-210 Issue 7 *"Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment"* and RSS-Gen Issue 2 *"General Requirements and Information for the Certification of Radiocommunication Equipment"*

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:	22 July 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.	**WC903868**	Date of issue:	22 July 2009
Product Description	USB/Ethernet 10/100 Base T/WLAN Transceiver		
Product Name	Caterpillar 802.11 a/b/g Radio		
Model / Serial No(s) Tested	50001520-01 / ---		
Manufacturer	Digi International		
Address	11001 Bren Road East		
	Minnetonka MN 55343		

Test Result ■ **Positive** ☐ **Negative**

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.

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REVISION RECORD

REVISION	TOTAL NUMBER OF PAGES	DATE	DESCRIPTION
	84	22 July 2009	Initial Release

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 Paragraphs (a)(2), (b)(3), (d), (e)
- Industry Canada RSS-210 Issue 7 Sections A8.2(a), A8.4(4), A8.5, A8.2(b), A9.2, A9.3
- Industry Canada RSS-Gen Issue 2 Sections 4.6.1, 7.2.2

ENVIRONMENTAL CONDITIONS IN THE LAB

	Actual
Temperature:	: 21-24°C
Atmospheric pressure	: 98-99 kPa
Relative Humidity	: 24-63%

POWER SUPPLY UTILIZED

Power supply system	: 12 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 MET
Testing was performed in accordance with the test procedure of FCC KDB Publication 558074
The minimum 6 dB bandwidth = 9.95 MHz

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

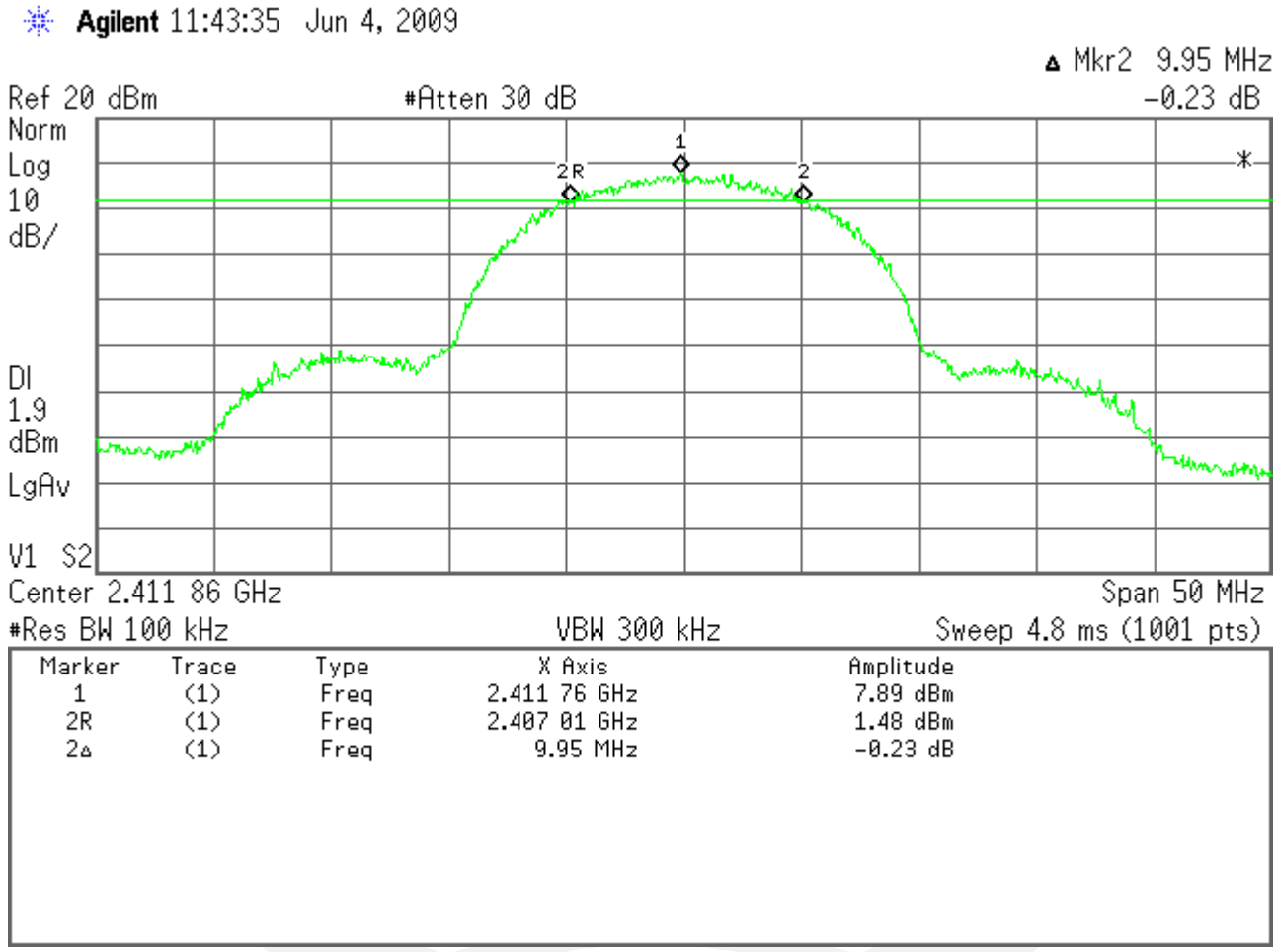
Test equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Due
WRLE03371	E4440A	Agilent	Spectrum Analyzer	MY43362222	14-Nov-09

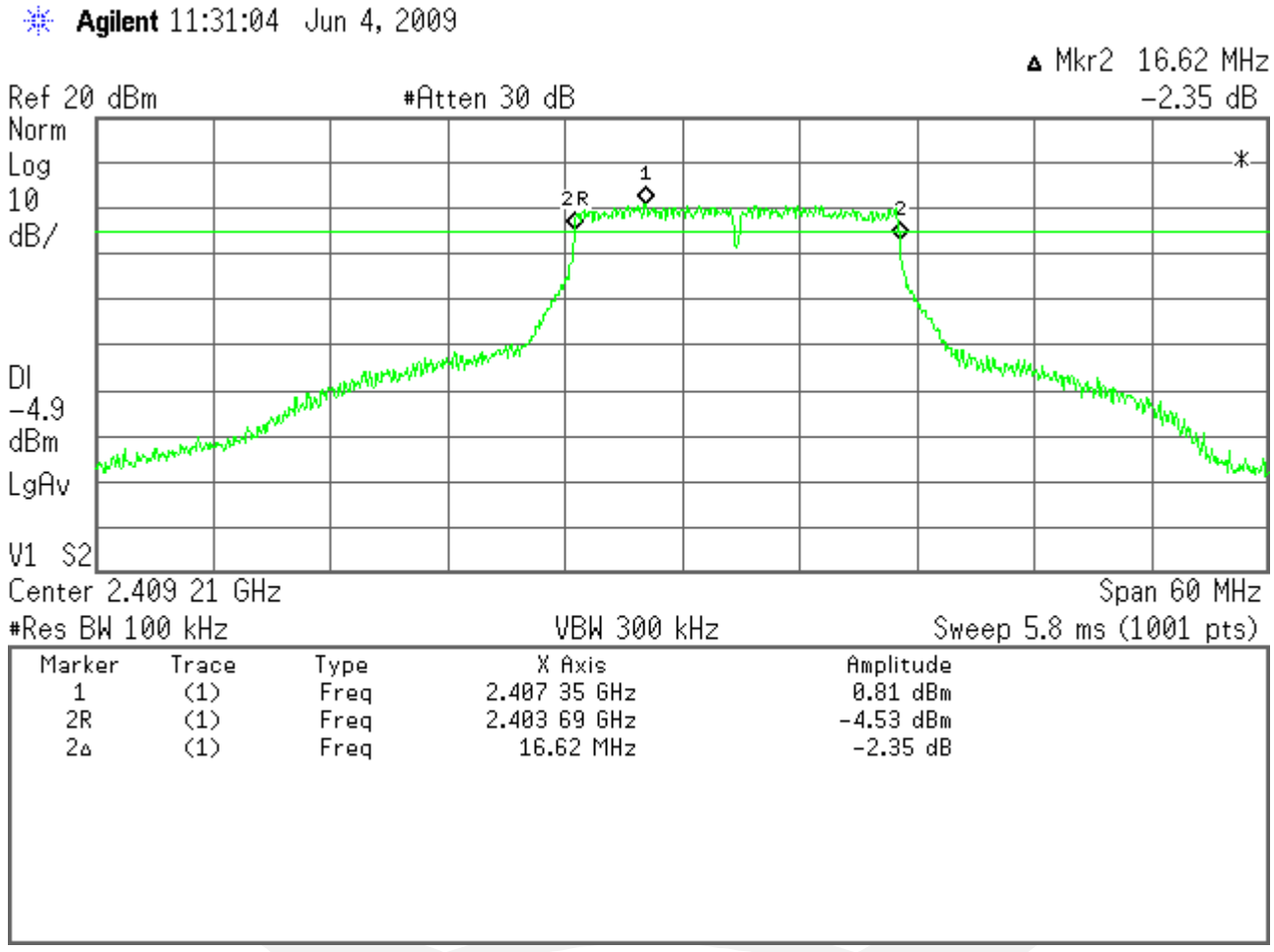
Test limit
500 kHz minimum

Test data
See following pages

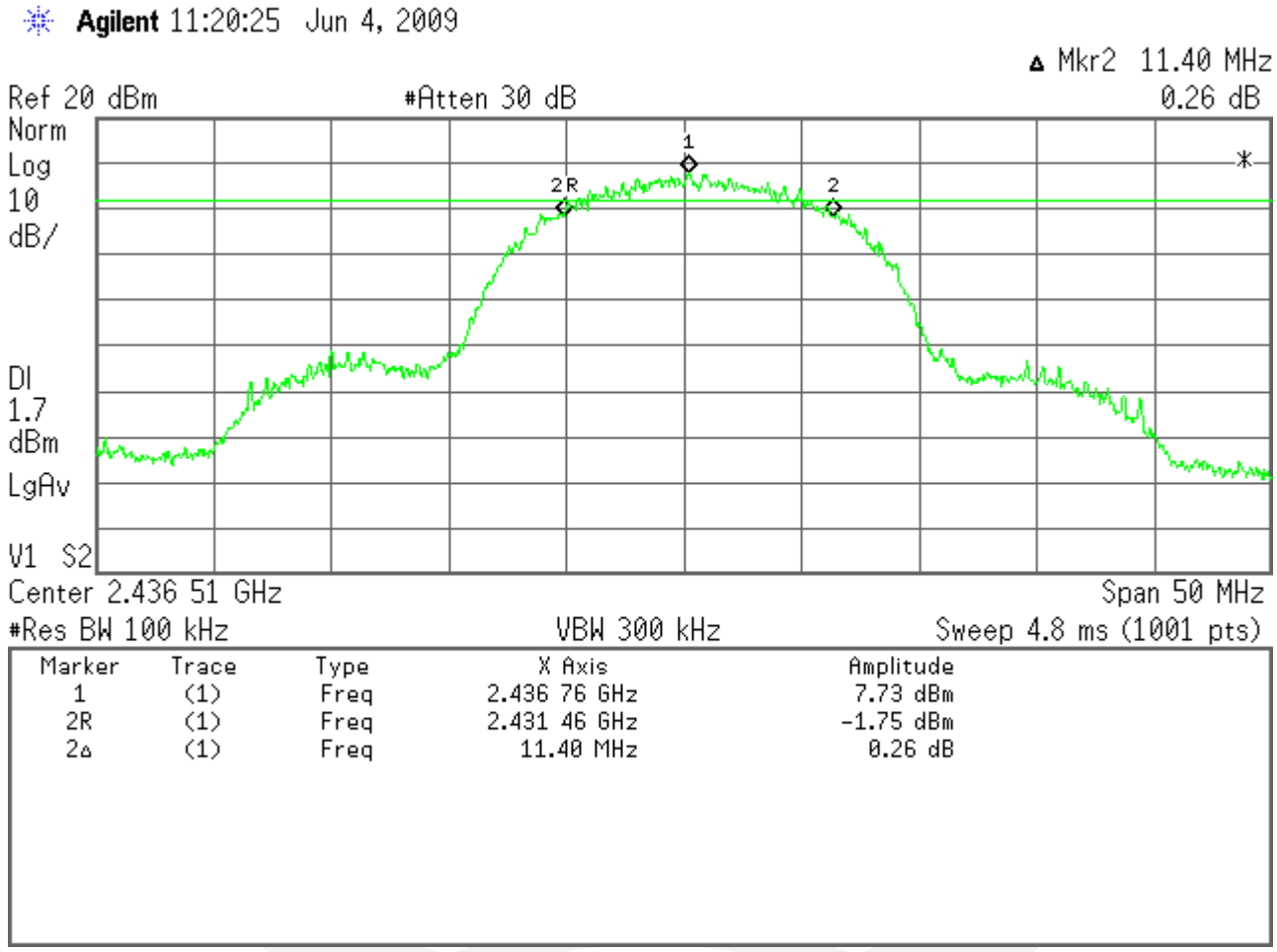
6 dB Bandwidth
Channel 1, 11 Mbps



6 dB Bandwidth
Channel 1, 54 Mbps

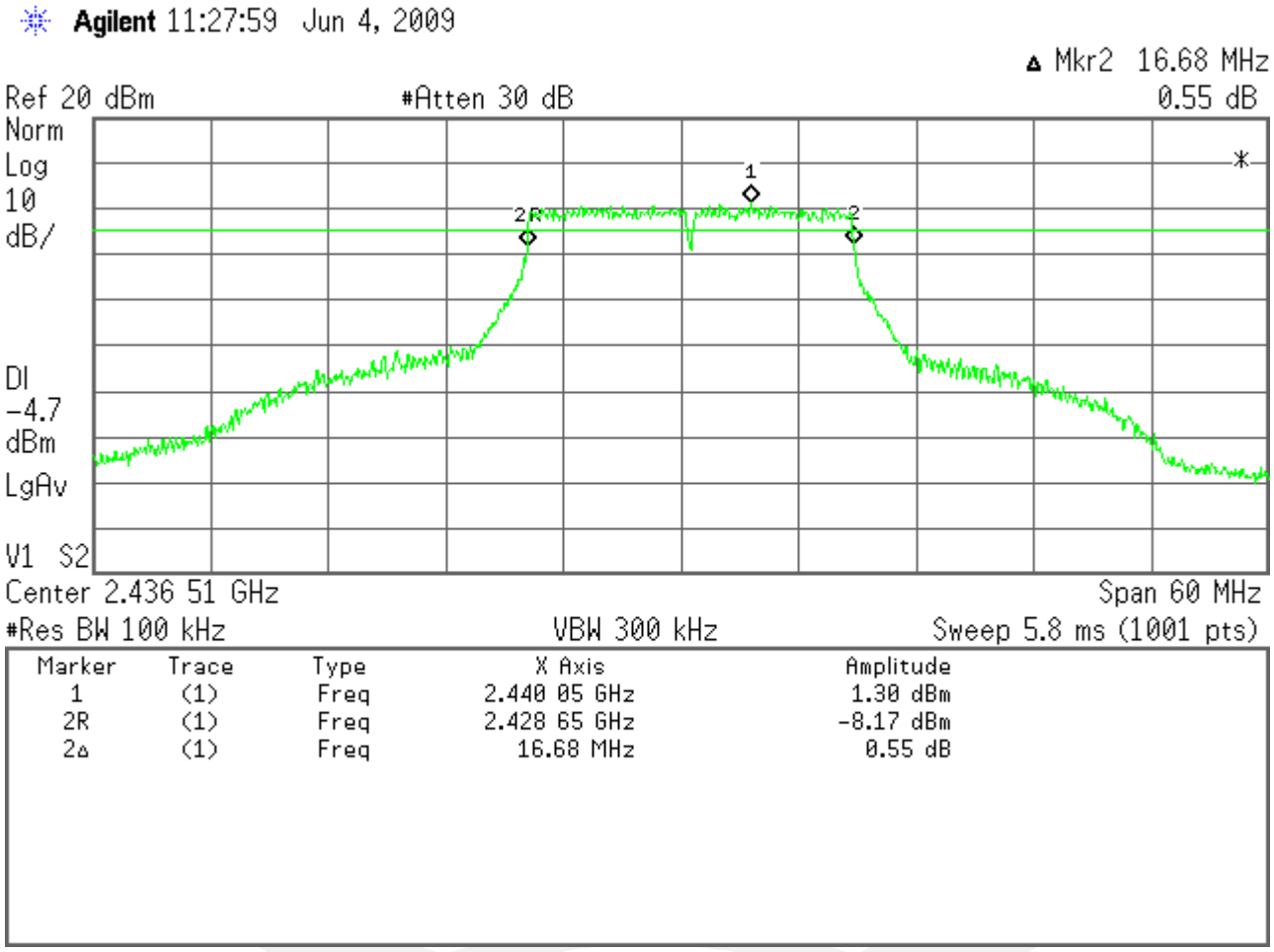


6 dB Bandwidth
Channel 6, 11 Mbps

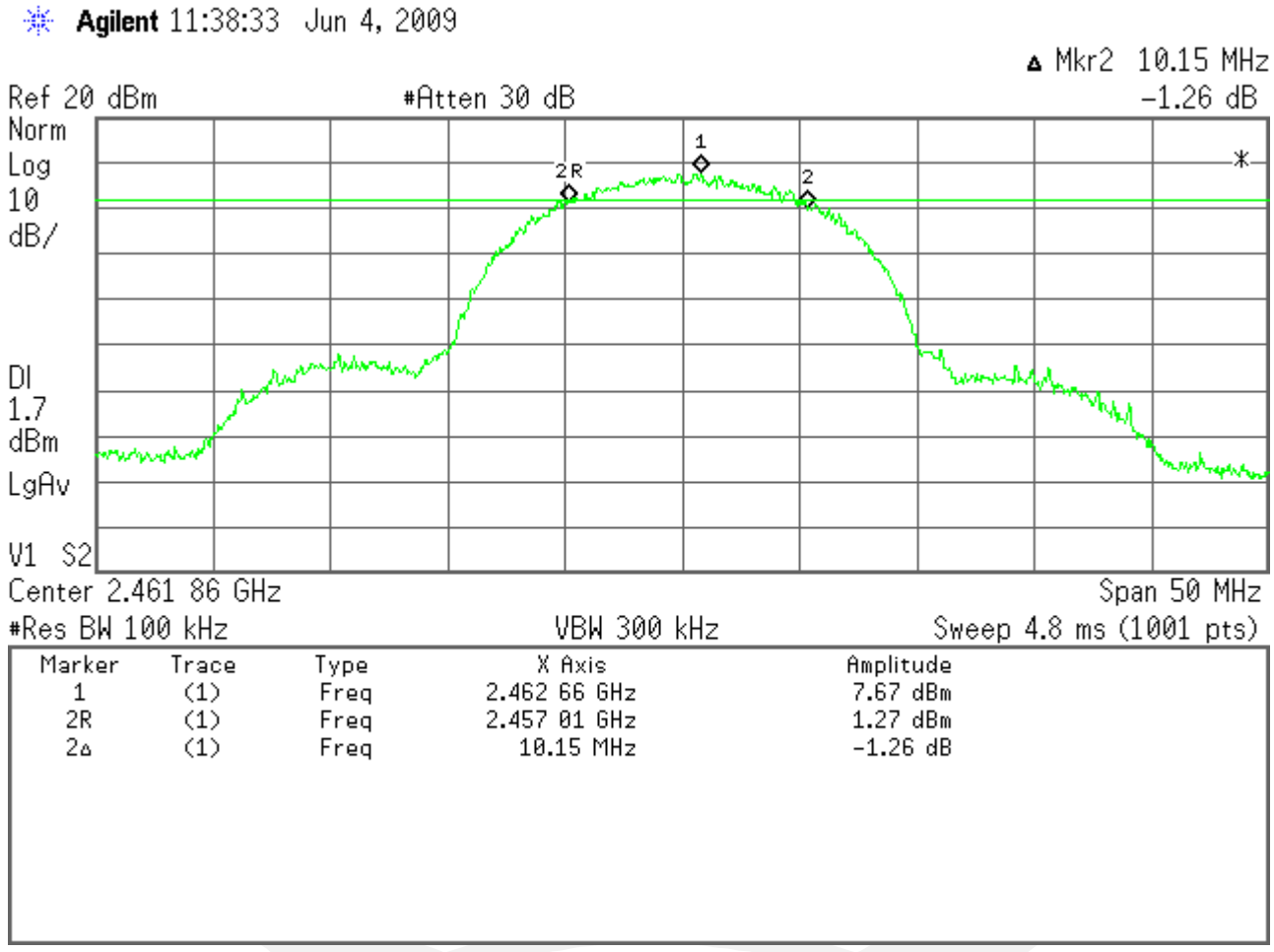


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.436 76 GHz	7.73 dBm
2R	(1)	Freq	2.431 46 GHz	-1.75 dBm
2Δ	(1)	Freq	11.40 MHz	0.26 dB

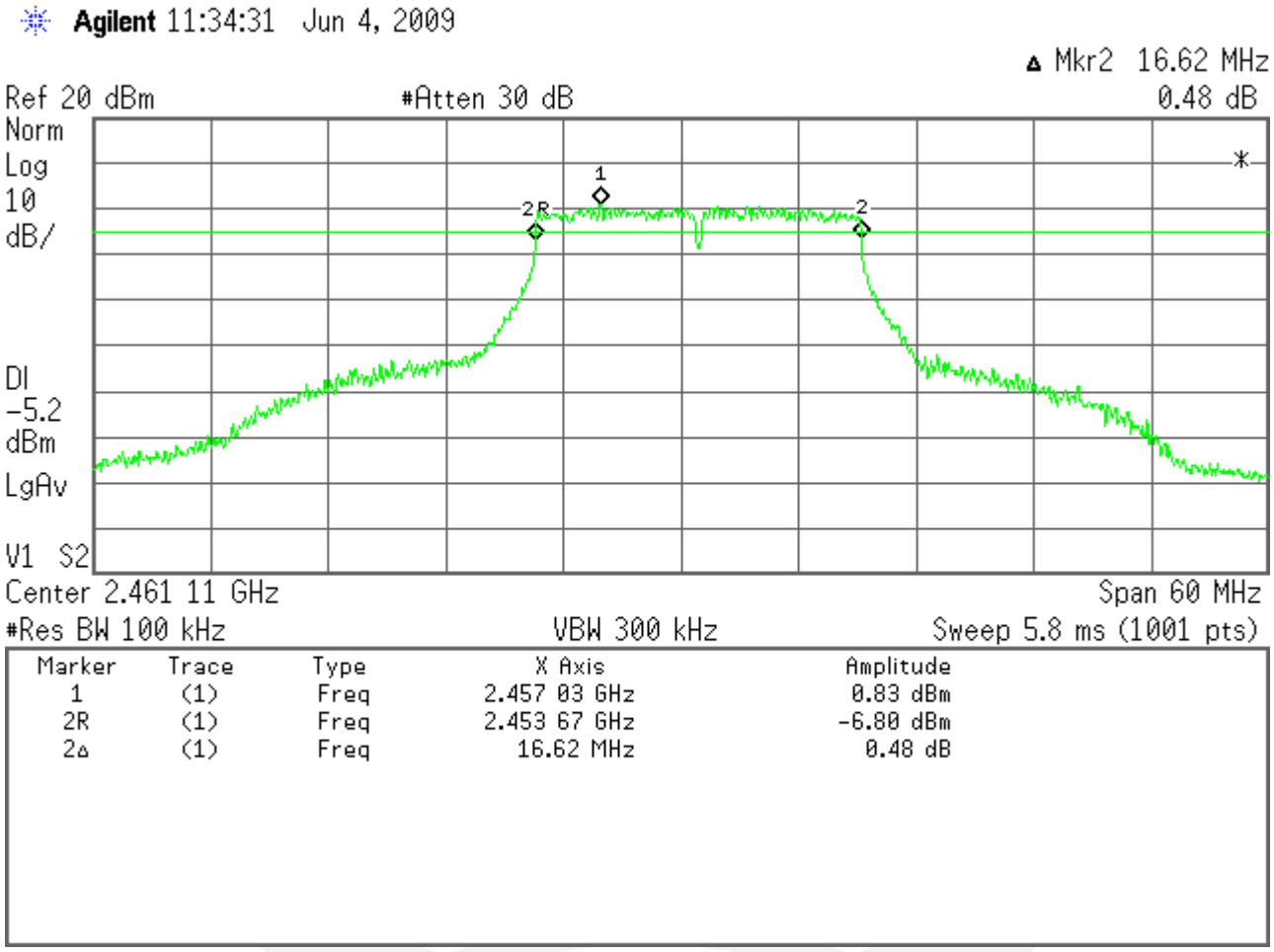
6 dB Bandwidth
Channel 6, 54 Mbps



6 dB Bandwidth
Channel 11, 11 Mbps



6 dB Bandwidth
Channel 11, 54 Mbps



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 with a power meter is 16.7 dBm or 0.0468 W
Power setting 45

Maximum antenna gain is 5 dBi.

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
NBLE03367	E4440A	Agilent	Spectrum Analyzer	MY42510439	20-Nov-09
WRLE03334	8542C	Giga-tronics	Peak Power Meter	1831096	18-Mar-10
WRLE03335	80350A	Giga-tronics	Peak Power Sensor	1828549	18-Mar-10

Test limit
1 watt

Test Data

Channel	Data rate (Mbps)	Peak power (dBm)
1	11	16.7
6	11	16.6
11	11	16.3
1	54	13.3
6	54	12.9
11	54	13.0

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 conducted spurious emission is -30.84 dBm at 2.4 GHz, -31.71 dBc (band edge)
Maximum radiated spurious emission is 53.85 dBµV/m avg or 493 µV/m at 3 meters at 2.390 GHz [bandedge]
Minimum margin of compliance = 0.15 dB
Average radiated measurements above 1 GHz with spectrum analyzer settings of 1 MHz RBW / 10 Hz VBW
Power setting 45

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
NBLE03367	E4440A	Agilent	Spectrum Analyzer	MY42510439	20-Nov-09
WRLE03978	SL26-3010	Phase One Microwave	Amplifier 18-26.5 GHz	0005	Code B 14-May-10
WRLE06717	3116	EMCO	Ridge Guide Ant 18-40 GHz	2005	03-Apr-10
NBLE02683	85650A	Hewlett-Packard	Quasi-peak Adapter	2430A00495	23-Feb-10
WRLE02675	85662A	Hewlett -Packard	Analyzer Display (C)	2542A11472	04-Aug-09
WRLE03294	8566B	Hewlett-Packard	Spectrum Analyzer	2349A03098	19-Mar-10
WRLE03847	ZHL-1042J	Mini-Circuits	Preamplifier 10 - 3000 MHz	0607	Code B 14-May-10
WRLE010527	SL18B4020	Phase One Microwave	Preamplifier 1 – 18 GHz	0001	Code B 10-Sep-09
WRLE03204	EM-6917B	Electro-Metrics	Biconicalog Periodic	102	17-Dec-09
WRLE03229	3115	EMCO	Ridge Guide Antenna	2483	15-Jul-10
WRLE03997	EWT-14-0066	EWT	2.4 GHz Notch filter	E2	Code B 23-Jan-10
WRLE02003	F550B1	Acronetics	4 – 8 GHz Bandpass Filter	010	Code B 10-Sep-09
WRLE03933	F551B-1	Acronetics	8 – 12 GHz Bandpass Filter	010	Code B 10-Sep-09
WRLE03934	F549B-1	Acronetics	2 – 4 GHz Bandpass Filter	010	Code B 10-Sep-09
WRLE03935	F548B-1	Acronetics	1 – 2 GHz Bandpass Filter	010	Code B 10-Sep-09

Cal Code B = Calibration verification performed internally.

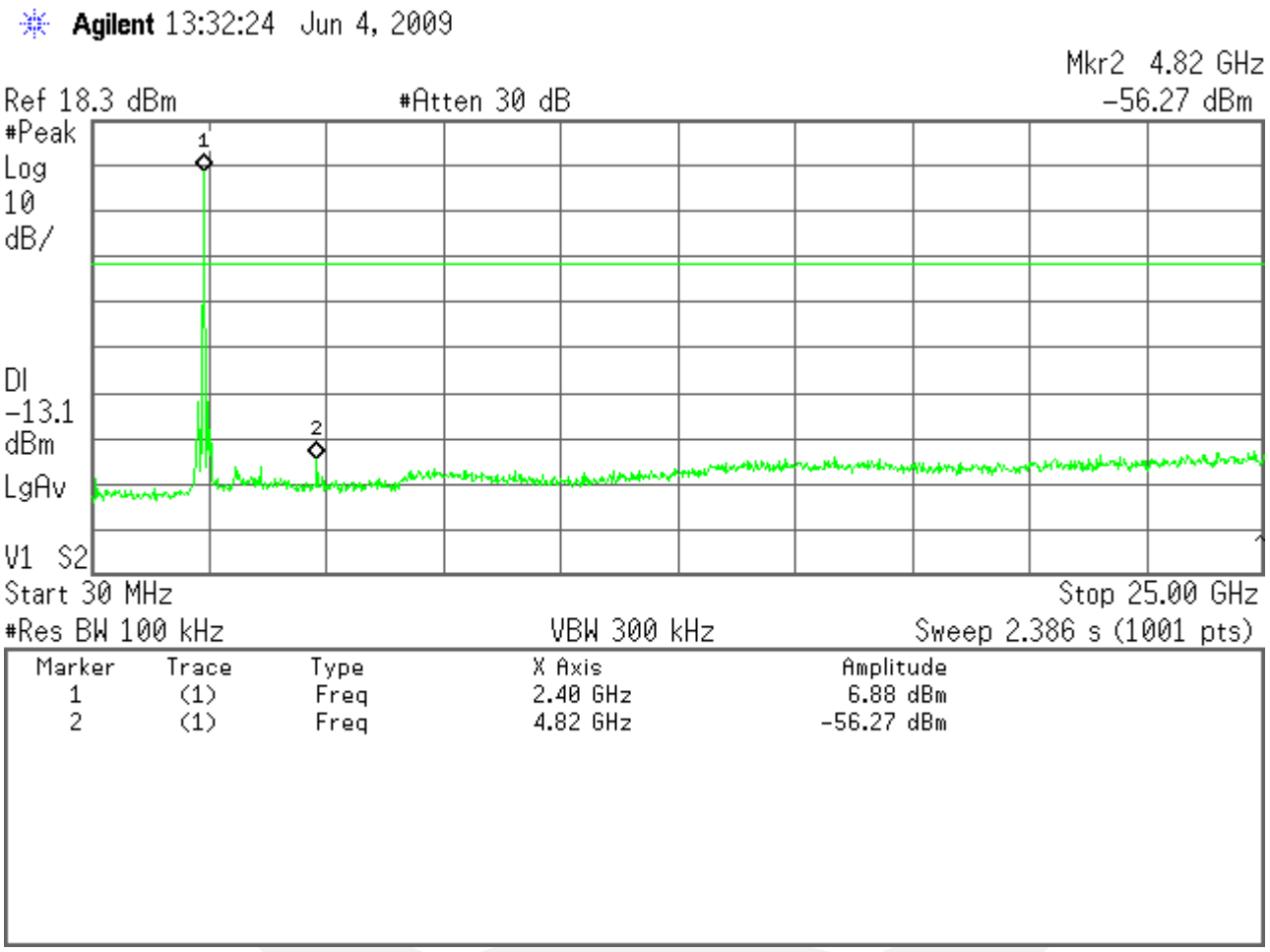
Test limit - conducted
-20 dBc

Test limit within restricted bands per 15.205 - radiated

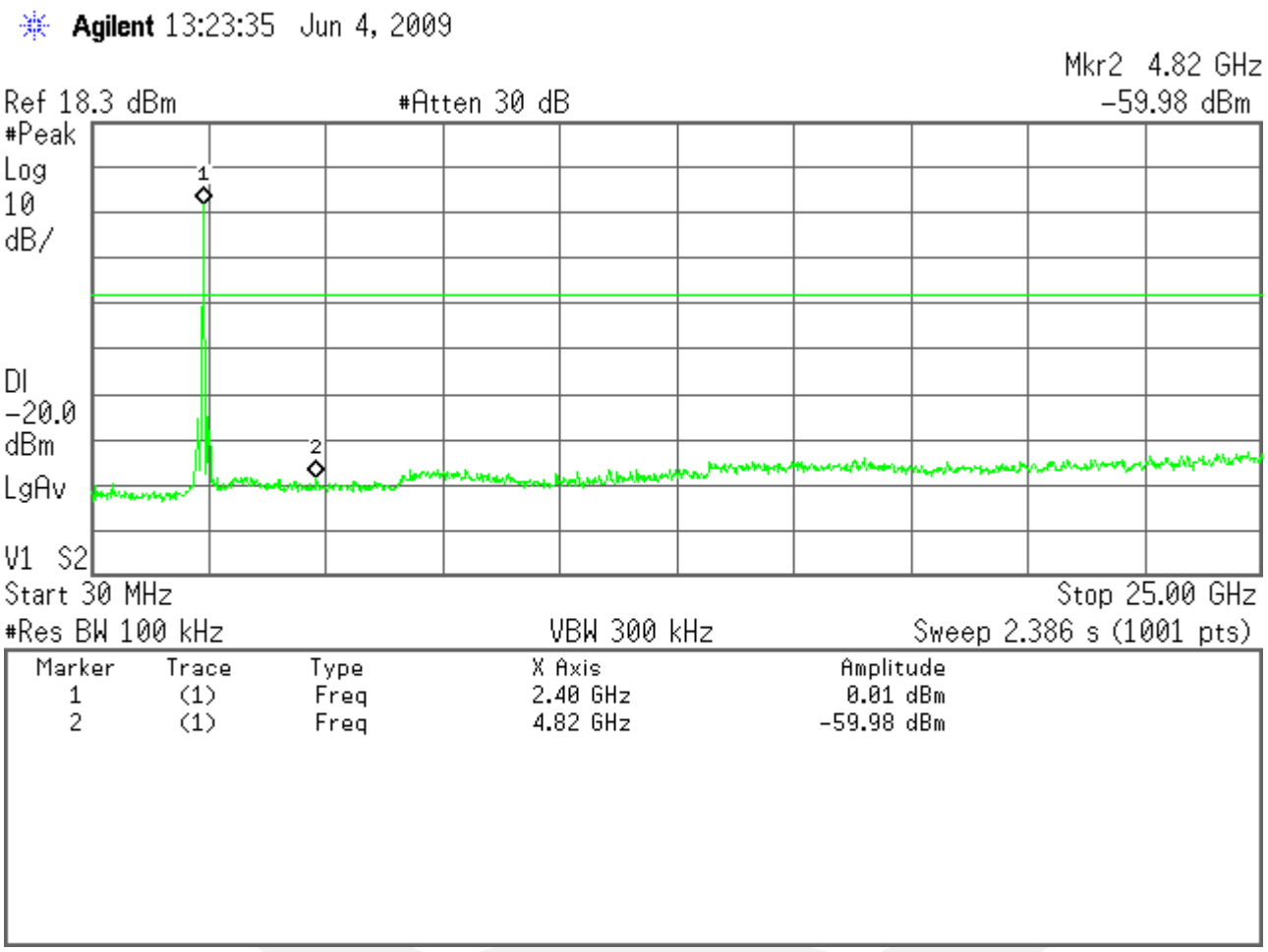
Frequncy (MHz)	Field strength (µV/meter)	Field strength (dBµV/meter)
30 - 88	100, QP	40.0
88 - 216	150, QP	43.5
216 - 960	200, QP	46.0
Above 960	500, QP	54.0
> 1000	500, AV 5000, PK	54.0 74.0

Test data
See following pages

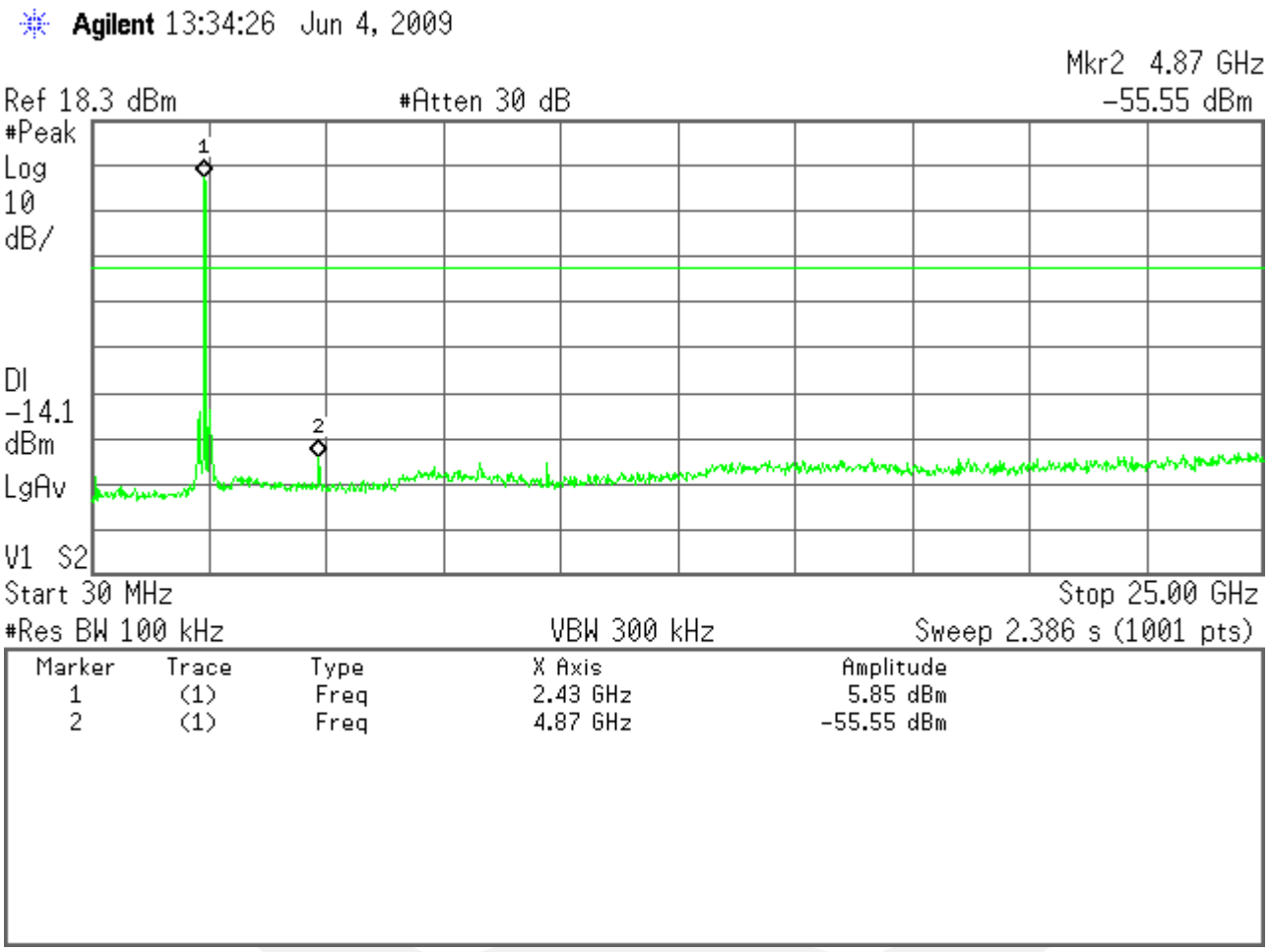
Conducted spurious emissions
Channel 1, 11 Mbps



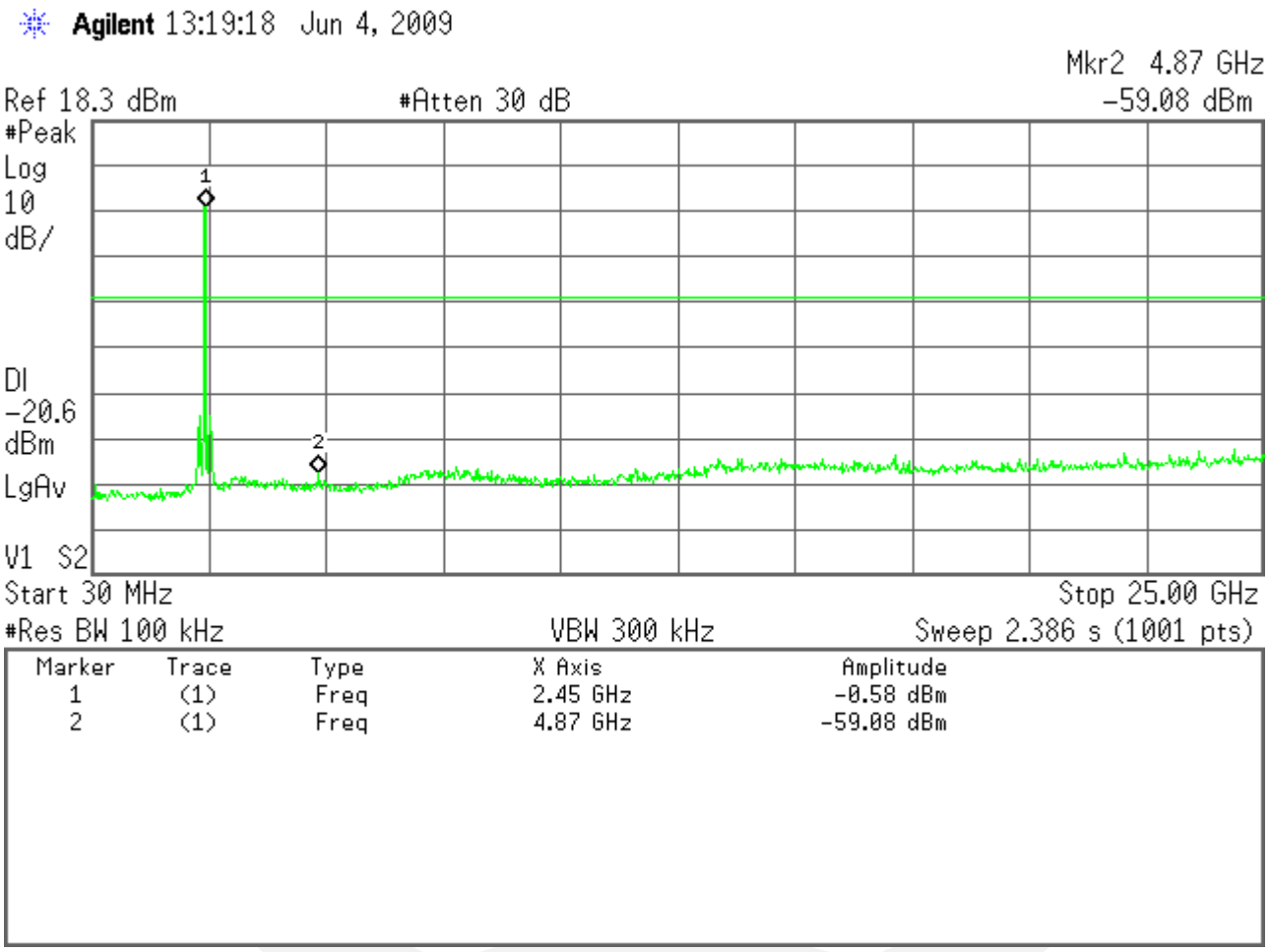
Conducted spurious emissions
Channel 1, 54 Mbps



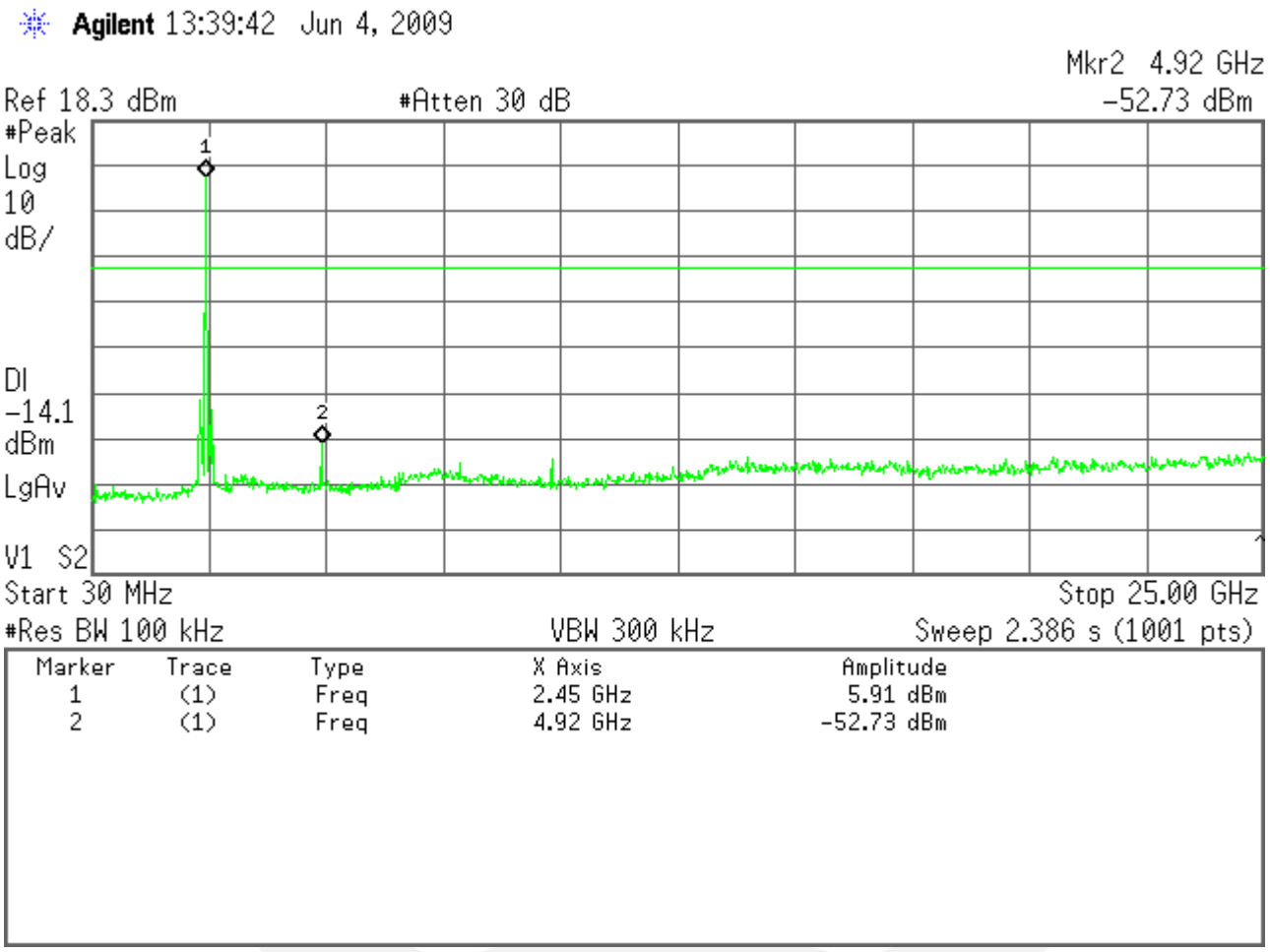
Conducted spurious emissions
Channel 6, 11 Mbps



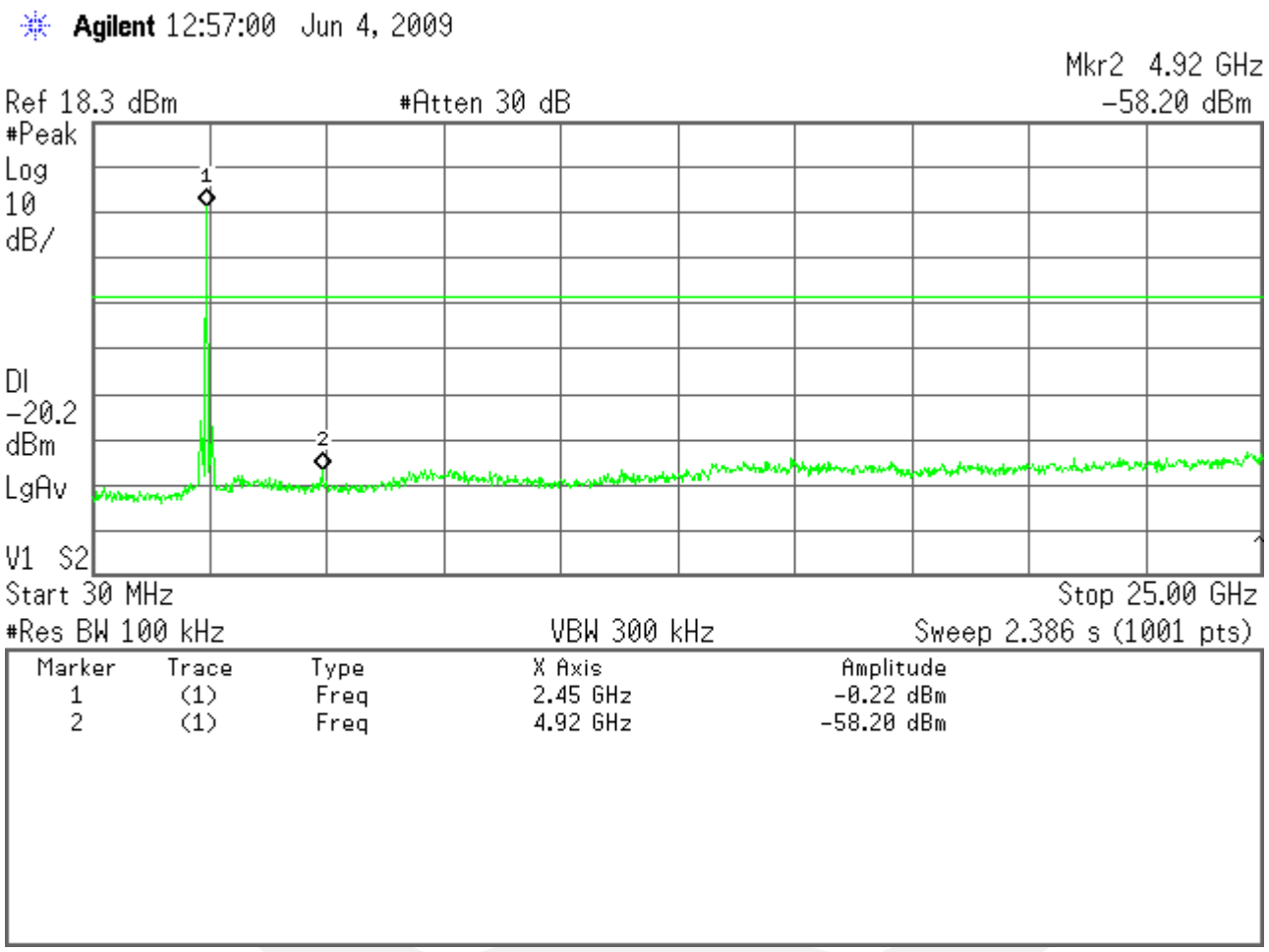
Conducted spurious emissions
Channel 6, 54 Mbps



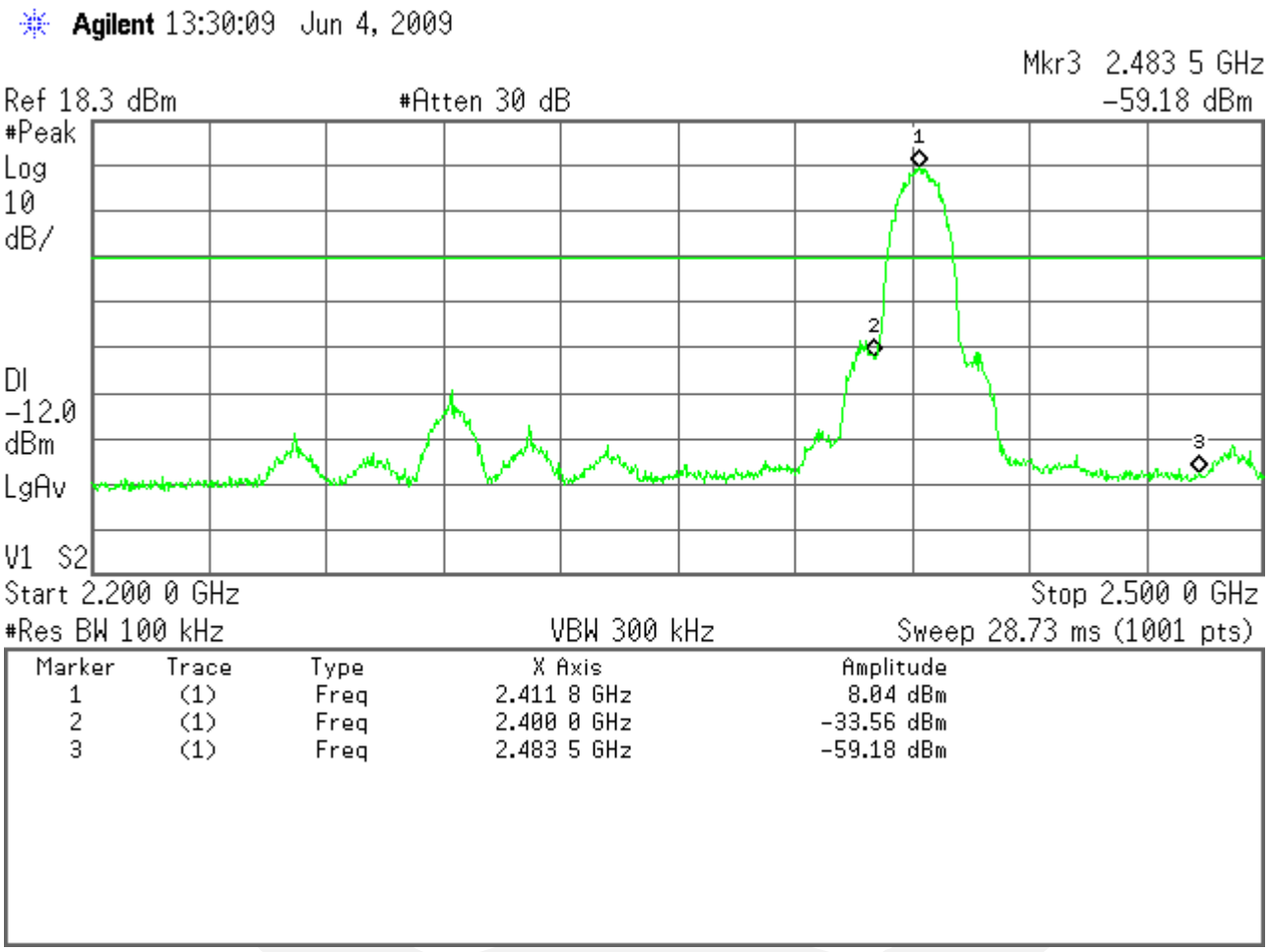
Conducted spurious emissions
Channel 11, 11 Mbps



Conducted spurious emissions
Channel 11, 54 Mbps

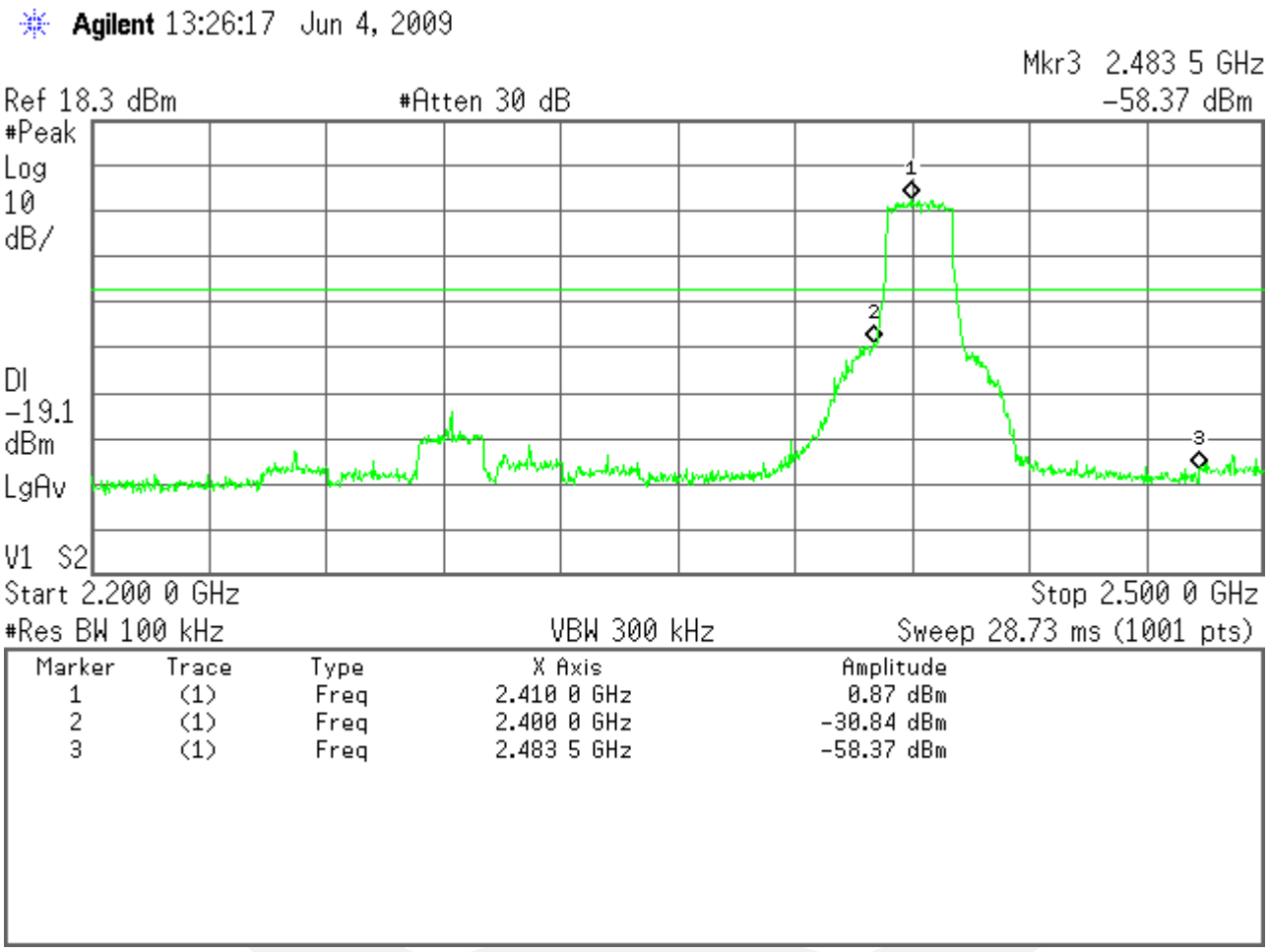


Conducted bandedge
Channel 1, 11 Mbps

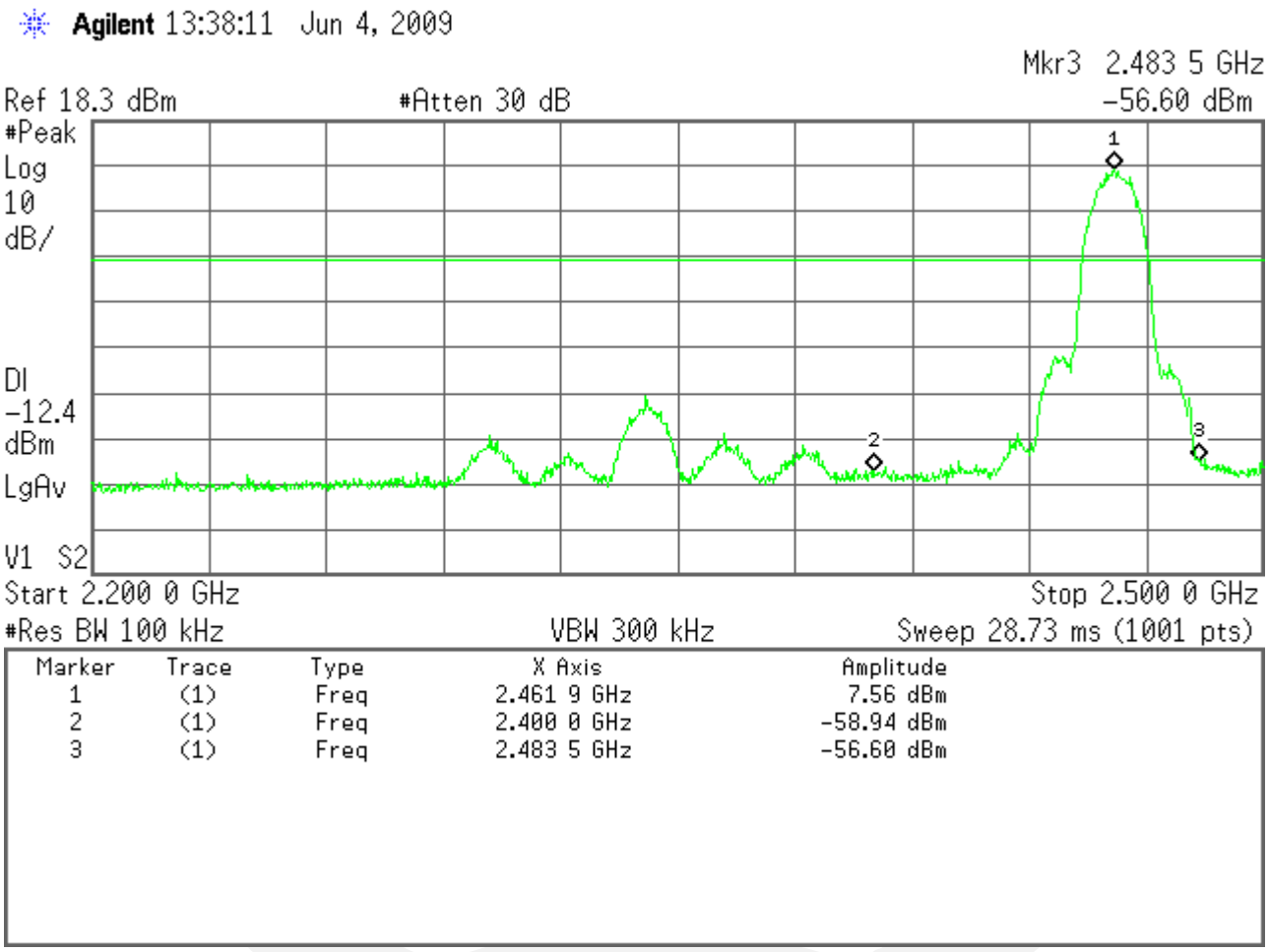


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.411 8 GHz	8.04 dBm
2	(1)	Freq	2.400 0 GHz	-33.56 dBm
3	(1)	Freq	2.483 5 GHz	-59.18 dBm

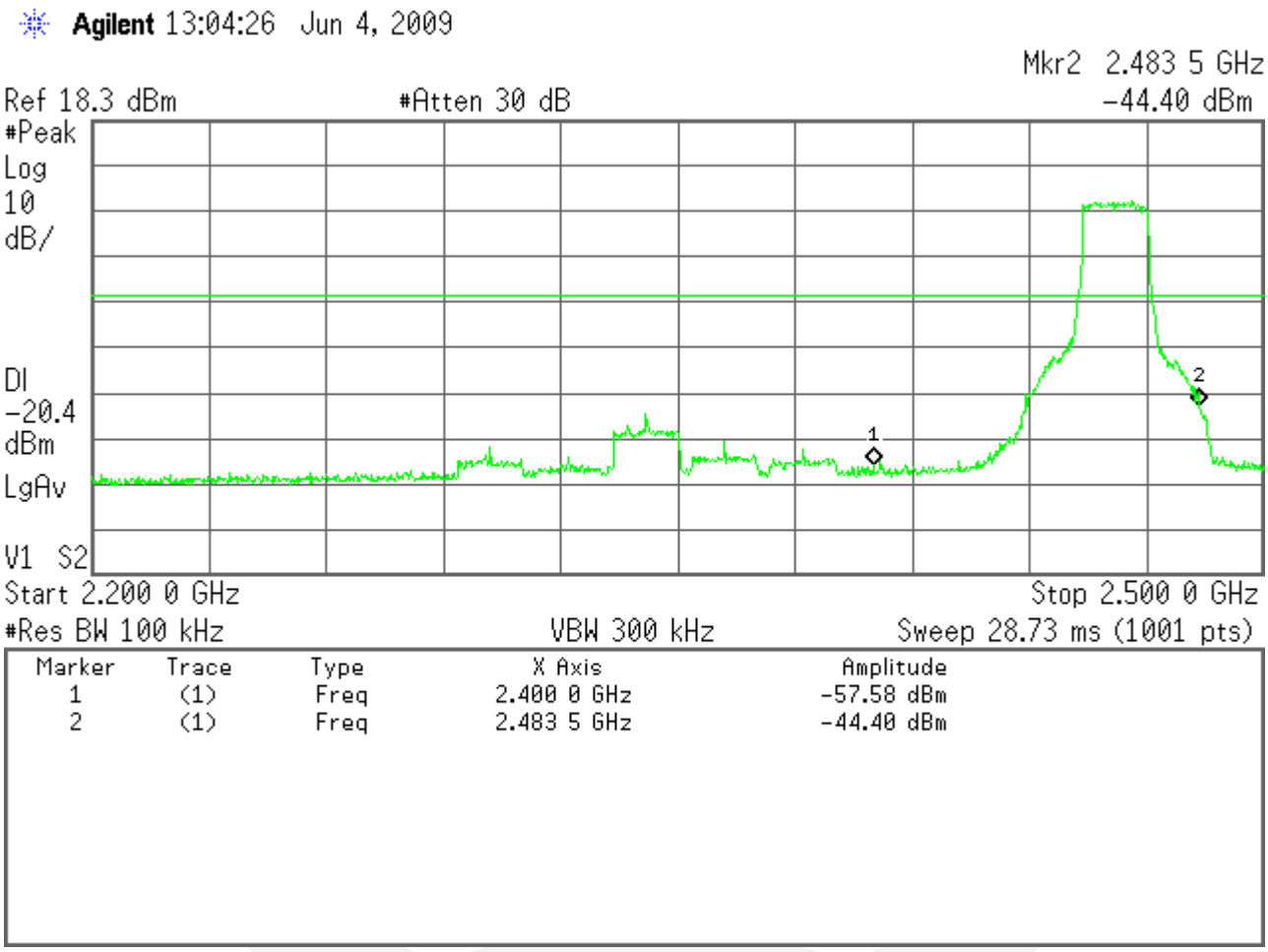
Conducted bandedge
Channel 1, 54 Mbps



Conducted bandedge
Channel 11, 11 Mbps



Conducted bandedge
Channel 11, 54 Mbps



RADIATED EMISSIONS

Test Report #:	WC903868 Run 3	Test Area:	LTS		
EUT Model #:	50001520-01	Date:	6/3/2009		
EUT Serial #:	N/A	EUT Power:	12vdc/5vdc	Temperature:	21.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	35.0 %
EUT Description:	USB/Ethernet 10/100 BaseT/WLAN Transceiver				
Notes:					
Data File Name:	3868 june 6 [gj revs].dat			Page:	1 of 5

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	DELTA2
2.41 GHz	69.49 Av	4.19 / 28.56 / 0.0 / 0.0	102.25	V / 1.00 / 0	n/a	n/a
Start of Scan 30 - 1000 MHz						
5dBi Antenna.						
ch1 54mb power setting 45						
73.8 MHz	39.55 Qp	0.55 / 8.82 / 29.7 / 0.0	19.22	V / 1.00 / 0	-20.78	n/a
119.998 MHz	41.6 Qp	0.84 / 8.58 / 29.7 / 0.01	21.32	V / 1.00 / 0	-22.18	n/a
124.998 MHz	43.15 Qp	0.85 / 8.25 / 29.7 / 0.01	22.56	V / 1.00 / 0	-20.94	n/a
167.985 MHz	33.35 Qp	0.96 / 8.85 / 29.8 / 0.01	13.37	V / 1.00 / 0	-30.13	n/a
271.725 MHz	32.55 Qp	1.21 / 12.58 / 29.8 / 0.02	16.56	V / 1.00 / 0	-29.44	n/a
280.017 MHz	38.2 Qp	1.22 / 12.47 / 29.82 / 0.02	22.08	V / 1.00 / 0	-23.92	n/a
399.99 MHz	33.05 Qp	1.36 / 15.95 / 30.0 / 0.02	20.38	V / 1.00 / 0	-25.62	n/a
399.99 MHz	37.3 Qp	1.36 / 15.95 / 30.0 / 0.02	24.63	V / 1.00 / 90	-21.37	n/a
167.985 MHz	36.45 Qp	0.96 / 8.85 / 29.8 / 0.01	16.47	V / 1.00 / 0	-27.03	n/a
280.017 MHz	38.6 Qp	1.22 / 12.47 / 29.82 / 0.02	22.48	V / 1.00 / 0	-23.52	n/a
113.088 MHz	39.4 Qp	0.82 / 8.79 / 29.7 / 0.01	19.31	V / 1.00 / 0	-24.19	n/a
149.97 MHz	39.35 Qp	0.92 / 8.5 / 29.8 / 0.01	18.98	V / 1.00 / 0	-24.52	n/a
168.798 MHz	37.45 Qp	0.96 / 8.89 / 29.8 / 0.01	17.52	V / 1.00 / 0	-25.98	n/a
960.01 MHz	39.55 Qp	2.82 / 22.6 / 29.7 / 0.06	35.33	V / 1.00 / 0	-18.67	n/a
280.017 MHz	39.25 Qp	1.22 / 12.47 / 29.82 / 0.02	23.13	V / 1.00 / 270	-22.87	n/a
149.922 MHz	44.2 Qp	0.92 / 8.51 / 29.8 / 0.01	23.83	H / 3.00 / 270	-19.67	n/a
124.998 MHz	40.45 Qp	0.85 / 8.25 / 29.7 / 0.01	19.86	H / 3.00 / 270	-23.64	n/a
137.253 MHz	41.35 Qp	0.88 / 7.89 / 29.7 / 0.01	20.43	H / 3.00 / 0	-23.07	n/a
244.083 MHz	35.5 Qp	1.16 / 11.55 / 29.72 / 0.01	18.5	H / 3.00 / 0	-27.5	n/a
258.657 MHz	33.95 Qp	1.2 / 12.09 / 29.8 / 0.01	17.45	H / 3.00 / 0	-28.55	n/a

Tested by: Robert J Behringer (Printed) _____ (Signature)

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

RADIATED EMISSIONS

Test Report #:	WC903868 Run 3	Test Area:	LTS		
EUT Model #:	50001520-01	Date:	6/3/2009		
EUT Serial #:	N/A	EUT Power:	12vdc/5vdc	Temperature:	21.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	35.0 %
EUT Description:	USB/Ethernet 10/100 BaseT/WLAN Transceiver				
Notes:					
Data File Name:	3868 june 6 [gj revs].dat			Page:	2 of 5

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	DELTA2
244.107 MHz	35.8 Qp	1.16 / 11.55 / 29.72 / 0.01	18.8	H / 3.00 / 180	-27.2	n/a
124.998 MHz	42.9 Qp	0.85 / 8.25 / 29.7 / 0.01	22.31	H / 3.00 / 90	-21.19	n/a
137.217 MHz	38.65 Qp	0.88 / 7.89 / 29.7 / 0.01	17.73	H / 3.00 / 90	-25.77	n/a
244.107 MHz	35.8 Qp	1.16 / 11.55 / 29.72 / 0.01	18.8	H / 3.00 / 90	-27.2	n/a
399.99 MHz	36.75 Qp	1.36 / 15.95 / 30.0 / 0.02	24.08	H / 3.00 / 90	-21.92	n/a
Maxed						
960.01 MHz	41.36 Qp	2.82 / 22.6 / 29.7 / 0.06	37.14	V / 1.03 / 196	-16.86	n/a
149.922 MHz	46.42 Qp	0.92 / 8.51 / 29.8 / 0.01	26.05	H / 1.75 / 254	-17.45	n/a
No new or higher emissions detected when on channel 6 or 11						
ch1 11mb power setting 45						
5dBi Antenna.						
280.017 MHz	39.5 Qp	1.22 / 12.47 / 29.82 / 0.02	23.38	V / 1.00 / 0	-22.62	n/a
124.998 MHz	44.1 Qp	0.85 / 8.25 / 29.7 / 0.01	23.51	V / 1.00 / 0	-19.99	n/a
240.027 MHz	36.3 Qp	1.15 / 11.4 / 29.7 / 0.01	19.16	V / 1.00 / 0	-26.84	n/a
359.988 MHz	37.35 Qp	1.32 / 15.0 / 30.0 / 0.02	23.69	V / 1.00 / 0	-22.31	n/a
385.362 MHz	35.05 Qp	1.34 / 15.36 / 30.0 / 0.02	21.78	V / 1.00 / 0	-24.22	n/a
240.027 MHz	40.45 Qp	1.15 / 11.4 / 29.7 / 0.01	23.31	V / 1.00 / 90	-22.69	n/a
359.988 MHz	40.1 Qp	1.32 / 15.0 / 30.0 / 0.02	26.44	V / 1.00 / 90	-19.56	n/a
385.362 MHz	41.6 Qp	1.34 / 15.36 / 30.0 / 0.02	28.33	V / 1.00 / 90	-17.67	n/a
385.362 MHz	45.05 Qp	1.34 / 15.36 / 30.0 / 0.02	31.78	V / 1.00 / 180	-14.22	n/a

Tested by: Robert J Behringer (Printed) _____ (Signature)

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

RADIATED EMISSIONS

Test Report #:	WC903868 Run 3	Test Area:	LTS		
EUT Model #:	50001520-01	Date:	6/3/2009		
EUT Serial #:	N/A	EUT Power:	12vdc/5vdc	Temperature:	21.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	35.0 %
EUT Description:	USB/Ethernet 10/100 BaseT/WLAN Transceiver				
Notes:					
Data File Name:	3868 june 6 [gj revs].dat			Page:	3 of 5

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	DELTA2
280.017 MHz	40.4 Qp	1.22 / 12.47 / 29.82 / 0.02	24.28	V / 1.00 / 270	-21.72	n/a
Maxed						
385.362 MHz	48.07 Qp	1.34 / 15.36 / 30.0 / 0.02	34.8	V / 1.18 / 170	-11.2	n/a
No new or higher emissions detected when on channel 6 or 11						
ch11 11mb power setting 45						
2dBi Antenna						
No new or higher emissions detected when on channel 1, 6 or 11						
ch1 54mb power setting 45						
2dBi Antenna						
No new or higher emissions detected when on channel 1, 6 or 11						
End of Scan						

Tested by: Robert J Behringer (Printed) _____ (Signature)

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

RADIATED EMISSIONS

Test Report #:	WC903868 Run 3	Test Area:	LTS		
EUT Model #:	50001520-01	Date:	6/3/2009		
EUT Serial #:	N/A	EUT Power:	12vdc/5vdc	Temperature:	21.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	35.0 %
EUT Description:	USB/Ethernet 10/100 BaseT/WLAN Transceiver				
Notes:					
Data File Name:	3868 june 6 [gj revs].dat			Page:	4 of 5

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

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC-B <1GHz 3m
385.362 MHz	48.07 Qp	1.34 / 15.36 / 30.0 / 0.02	34.8	V / 1.18 / 170	-11.2
960.01 MHz	41.36 Qp	2.82 / 22.6 / 29.7 / 0.06	37.14	V / 1.03 / 196	-16.86
149.922 MHz	46.42 Qp	0.92 / 8.51 / 29.8 / 0.01	26.05	H / 1.75 / 254	-17.45
359.988 MHz	40.1 Qp	1.32 / 15.0 / 30.0 / 0.02	26.44	V / 1.00 / 90	-19.56
124.998 MHz	44.1 Qp	0.85 / 8.25 / 29.7 / 0.01	23.51	V / 1.00 / 0	-19.99
73.8 MHz	39.55 Qp	0.55 / 8.82 / 29.7 / 0.0	19.22	V / 1.00 / 0	-20.78
399.99 MHz	37.3 Qp	1.36 / 15.95 / 30.0 / 0.02	24.63	V / 1.00 / 90	-21.37
280.017 MHz	40.4 Qp	1.22 / 12.47 / 29.82 / 0.02	24.28	V / 1.00 / 270	-21.72
119.998 MHz	41.6 Qp	0.84 / 8.58 / 29.7 / 0.01	21.32	V / 1.00 / 0	-22.18
240.027 MHz	40.45 Qp	1.15 / 11.4 / 29.7 / 0.01	23.31	V / 1.00 / 90	-22.69
137.253 MHz	41.35 Qp	0.88 / 7.89 / 29.7 / 0.01	20.43	H / 3.00 / 0	-23.07
113.088 MHz	39.4 Qp	0.82 / 8.79 / 29.7 / 0.01	19.31	V / 1.00 / 0	-24.19
168.798 MHz	37.45 Qp	0.96 / 8.89 / 29.8 / 0.01	17.52	V / 1.00 / 0	-25.98
167.985 MHz	36.45 Qp	0.96 / 8.85 / 29.8 / 0.01	16.47	V / 1.00 / 0	-27.03
244.107 MHz	35.8 Qp	1.16 / 11.55 / 29.72 / 0.01	18.8	H / 3.00 / 180	-27.2
258.657 MHz	33.95 Qp	1.2 / 12.09 / 29.8 / 0.01	17.45	H / 3.00 / 0	-28.55
271.725 MHz	32.55 Qp	1.21 / 12.58 / 29.8 / 0.02	16.56	V / 1.00 / 0	-29.44

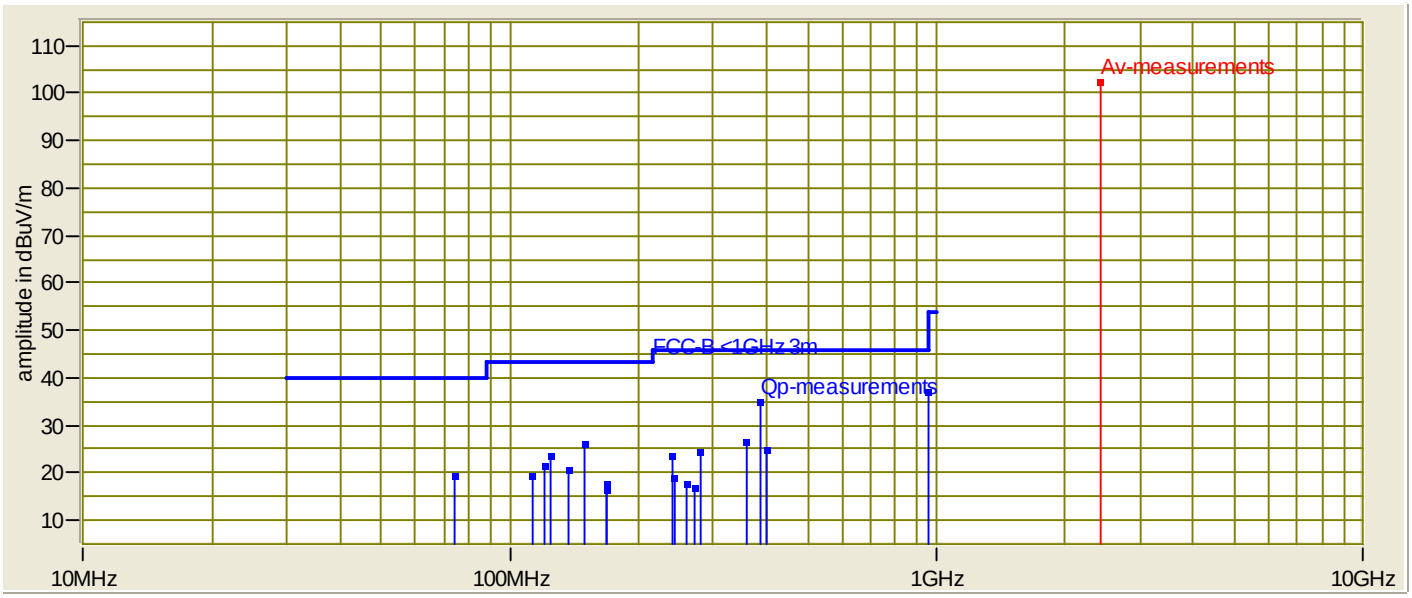
Tested by: Robert J Behringer (Printed) _____ (Signature)

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

RADIATED EMISSIONS

Test Report #:	WC903868 Run 3	Test Area:	LTS		
EUT Model #:	50001520-01	Date:	6/3/2009		
EUT Serial #:	N/A	EUT Power:	12vdc/5vdc	Temperature:	21.0 °C
Test Method:	FCC 15.247			Air Pressure:	98.0 kPa
Customer:	Digi			Rel. Humidity:	35.0 %
EUT Description:	USB/Ethernet 10/100 BaseT/WLAN Transceiver				
Notes:					
Data File Name:	3868 june 6 [gj revs].dat			Page:	5 of 5

Graph:



Tested by: Robert J Behringer (Printed) _____ (Signature)

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

RADIATED EMISSIONS

Test Report #:	WC903868 Run 1	Test Area:	LTS		
EUT Model #:	50001520-01	Date:	6/3/2009		
EUT Serial #:	N/A	EUT Power:	12vdc	Temperature:	26.0 °C
Test Method:	FCC 15.247			Air Pressure:	99.0 kPa
Customer:	Digi			Rel. Humidity:	30.0 %
EUT Description:	USB/Ethernet 10/100 BaseT/WLAN Transceiver				
Notes:					
Data File Name:	3868 june 6 [gj revs].dat			Page:	1 of 8

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC B >1GHz 3m ave	DELTA2 FCC B >1G 3 M peak
11Mbps, power setting 45, emissions maximized						
Begin scan 1-18 GHz in restricted bands						
2dBi antenna						
ch 11 2.46 GHz.						
4.924 GHz	63.9 Pk	6.61 / 32.91 / 43.64 / 0.65	60.42	V / 1.05 / 132	n/a	-13.58
4.924 GHz	53.42 Av	6.61 / 32.91 / 43.64 / 0.65	49.94	V / 1.05 / 132	-4.06	n/a
4.924 GHz	62.0 Pk	6.61 / 32.91 / 43.64 / 0.65	58.52	H / 1.50 / 130	n/a	-15.48
4.924 GHz	50.22 Av	6.61 / 32.91 / 43.64 / 0.65	46.74	H / 1.50 / 130	-7.26	n/a
1.011 GHz	58.65 Pk	3.06 / 24.24 / 40.4 / 0.06	45.61	H / 1.00 / 204	n/a	-28.39
1.011 GHz	44.18 Av	3.06 / 24.24 / 40.4 / 0.06	31.14	H / 1.00 / 204	-22.86	n/a
ch 6 2.43 GHz.						
4.874 GHz	58.05 Pk	6.56 / 32.81 / 43.61 / 0.62	54.43	H / 1.20 / 128	n/a	-19.57
4.874 GHz	47.15 Av	6.56 / 32.81 / 43.61 / 0.62	43.53	H / 1.20 / 128	-10.47	n/a
4.874 GHz	62.05 Pk	6.56 / 32.81 / 43.61 / 0.62	58.43	V / 1.05 / 126	n/a	-15.57
4.874 GHz	50.71 Av	6.56 / 32.81 / 43.61 / 0.62	47.09	V / 1.05 / 126	-6.91	n/a
1.011 GHz	58.75 Pk	3.06 / 24.24 / 40.4 / 0.06	45.71	H / 1.00 / 206	n/a	-28.29
1.011 GHz	43.84 Av	3.06 / 24.24 / 40.4 / 0.06	30.8	H / 1.00 / 206	-23.2	n/a
ch 1 2.4 GHz						
4.824 GHz	61.95 Pk	6.51 / 32.72 / 43.57 / 0.59	58.2	V / 1.06 / 126	n/a	-15.8
4.824 GHz	50.76 Av	6.51 / 32.72 / 43.57 / 0.59	47.01	V / 1.06 / 126	-6.99	n/a
4.824 GHz	58.4 Pk	6.51 / 32.72 / 43.57 / 0.59	54.65	H / 1.20 / 129	n/a	-19.35
4.824 GHz	46.71 Av	6.51 / 32.72 / 43.57 / 0.59	42.96	H / 1.20 / 129	-11.04	n/a

Tested by: Robert J Behringer (Printed) _____ (Signature)

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

RADIATED EMISSIONS

Test Report #:	WC903868 Run 1	Test Area:	LTS		
EUT Model #:	50001520-01	Date:	6/3/2009		
EUT Serial #:	N/A	EUT Power:	12vdc	Temperature:	26.0 °C
Test Method:	FCC 15.247			Air Pressure:	99.0 kPa
Customer:	Digi			Rel. Humidity:	30.0 %
EUT Description:	USB/Ethernet 10/100 BaseT/WLAN Transceiver				
Notes:					
Data File Name:	3868 june 6 [gj revs].dat			Page:	2 of 8

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC B >1GHz 3m ave	DELTA2 FCC B >1G 3 M peak
1.011 GHz	59.35 Pk	3.06 / 24.24 / 40.4 / 0.06	46.31	H / 1.00 / 205	n/a	-27.69
1.011 GHz	43.81 Av	3.06 / 24.24 / 40.4 / 0.06	30.77	H / 1.00 / 205	-23.23	n/a
54Mbps, power setting 45, emissions maximized						
2dBi antenna						
ch 1 2.4 GHz						
4.824 GHz	54.9 Pk	6.51 / 32.72 / 43.57 / 0.59	51.15	V / 1.10 / 100	n/a	-22.85
4.824 GHz	48.23 Av	6.51 / 32.72 / 43.57 / 0.59	44.48	V / 1.10 / 100	-9.52	n/a
4.824 GHz	48.7 Pk	6.51 / 32.72 / 43.57 / 0.59	44.95	H / 1.10 / 170	n/a	-29.05
4.824 GHz	41.77 Av	6.51 / 32.72 / 43.57 / 0.59	38.02	H / 1.10 / 170	-15.98	n/a
1.008 GHz	58.2 Pk	3.05 / 24.23 / 40.4 / 0.06	45.14	H / 1.00 / 209	n/a	-28.86
1.008 GHz	47.18 Av	3.05 / 24.23 / 40.4 / 0.06	34.12	H / 1.00 / 209	-19.88	n/a
2.292 GHz	64.5 Pk	4.11 / 28.29 / 43.89 / 0.5	53.5	V / 2.15 / 11	n/a	-20.5
2.292 GHz	58.72 Av	4.11 / 28.29 / 43.89 / 0.5	47.72	V / 2.15 / 11	-6.28	n/a
ch 6 2.43 GHz.						
4.874 GHz	52.8 Pk	6.56 / 32.81 / 43.61 / 0.62	49.18	V / 1.10 / 101	n/a	-24.82
4.874 GHz	47.03 Av	6.56 / 32.81 / 43.61 / 0.62	43.41	V / 1.10 / 101	-10.59	n/a
4.874 GHz	48.3 Pk	6.56 / 32.81 / 43.61 / 0.62	44.68	H / 1.40 / 169	n/a *	-29.32
4.874 GHz	41.09 Av	6.56 / 32.81 / 43.61 / 0.62	37.47	H / 1.40 / 169	-16.53	n/a
1.008 GHz	58.65 Pk	3.05 / 24.23 / 40.4 / 0.06	45.59	H / 1.00 / 209	n/a	-28.41
1.008 GHz	47.59 Av	3.05 / 24.23 / 40.4 / 0.06	34.53	H / 1.00 / 209	-19.47	n/a
ch 11 2.46 GHz.						
2.342 GHz	65.7 Pk	4.14 / 28.4 / 43.71 / 0.78	55.31	V / 2.07 / 11	n/a	-18.69
2.342 GHz	59.47 Av	4.14 / 28.4 / 43.71 / 0.78	49.08	V / 2.07 / 11	-4.92	n/a

Tested by: Robert J Behringer (Printed) _____ (Signature)

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

RADIATED EMISSIONS

Test Report #:	WC903868 Run 1	Test Area:	LTS		
EUT Model #:	50001520-01	Date:	6/3/2009		
EUT Serial #:	N/A	EUT Power:	12vdc	Temperature:	26.0 °C
Test Method:	FCC 15.247			Air Pressure:	99.0 kPa
Customer:	Digi			Rel. Humidity:	30.0 %
EUT Description:	USB/Ethernet 10/100 BaseT/WLAN Transceiver				
Notes:					
Data File Name:	3868 june 6 [gj revs].dat			Page:	3 of 8

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC B >1GHz 3m ave	DELTA2 FCC B >1G 3 M peak
2.582 GHz	62.9 Pk	4.32 / 28.97 / 44.03 / 0.98	53.14	V / 2.15 / 18	n/a	-20.86
2.582 GHz	56.35 Av	4.32 / 28.97 / 44.03 / 0.98	46.59	V / 2.15 / 18	-7.41	n/a
1.008 GHz	59.35 Pk	3.05 / 24.23 / 40.4 / 0.06	46.29	H / 1.00 / 203	n/a	-27.71
1.008 GHz	47.44 Av	3.05 / 24.23 / 40.4 / 0.06	34.38	H / 1.00 / 203	-19.62	n/a
4.924 GHz	56.8 Pk	6.61 / 32.91 / 43.64 / 0.65	53.32	V / 1.04 / 127	n/a	-20.68
4.924 GHz	47.72 Av	6.61 / 32.91 / 43.64 / 0.65	44.24	V / 1.04 / 127	-9.76	n/a
4.924 GHz	49.15 Pk	6.61 / 32.91 / 43.64 / 0.65	45.67	H / 1.21 / 171	n/a	-28.33
4.924 GHz	40.91 Av	6.61 / 32.91 / 43.64 / 0.65	37.43	H / 1.21 / 171	-16.57	n/a
11Mbps, power setting 45, emissions maximized						
5dBi antenna						
ch 1 2.4 GHz						
4.824 GHz	63.4 Pk	6.51 / 32.72 / 43.57 / 0.59	59.65	V / 1.27 / 96	n/a	-14.35
4.824 GHz	52.41 Av	6.51 / 32.72 / 43.57 / 0.59	48.66	V / 1.27 / 96	-5.34	n/a
4.824 GHz	60.65 Pk	6.51 / 32.72 / 43.57 / 0.59	56.9	H / 1.55 / 22	n/a	-17.1
4.824 GHz	50.51 Av	6.51 / 32.72 / 43.57 / 0.59	46.76	H / 1.55 / 22	-7.24	n/a
1.008 GHz	58.95 Pk	3.05 / 24.23 / 40.4 / 0.06	45.89	H / 1.00 / 199	n/a	-28.11
1.008 GHz	48.05 Av	3.05 / 24.23 / 40.4 / 0.06	34.99	H / 1.00 / 199	-19.01	n/a
2.292 GHz	64.65 Pk	4.11 / 28.29 / 43.89 / 0.85	54.0	V / 1.00 / 273	n/a	-20.0
2.292 GHz	59.39 Av	4.11 / 28.29 / 43.89 / 0.85	48.74	V / 1.00 / 273	-5.26	n/a
ch 6 2.43 GHz.						
4.874 GHz	64.25 Pk	6.56 / 32.81 / 43.61 / 0.62	60.63	V / 1.62 / 106	n/a	-13.37
4.874 GHz	53.92 Av	6.56 / 32.81 / 43.61 / 0.62	50.3	V / 1.62 / 106	-3.7	n/a
4.874 GHz	62.0 Pk	6.56 / 32.81 / 43.61 / 0.62	58.38	H / 1.75 / 55	n/a	-15.62
4.874 GHz	50.59 Av	6.56 / 32.81 / 43.61 / 0.62	46.97	H / 1.75 / 55	-7.03	n/a

Tested by: Robert J Behringer (Printed) _____ (Signature)

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

RADIATED EMISSIONS

Test Report #:	WC903868 Run 1	Test Area:	LTS		
EUT Model #:	50001520-01	Date:	6/3/2009		
EUT Serial #:	N/A	EUT Power:	12vdc	Temperature:	26.0 °C
Test Method:	FCC 15.247			Air Pressure:	99.0 kPa
Customer:	Digi			Rel. Humidity:	30.0 %
EUT Description:	USB/Ethernet 10/100 BaseT/WLAN Transceiver				
Notes:					
Data File Name:	3868 june 6 [gj revs].dat			Page:	4 of 8

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC B >1GHz 3m ave	DELTA2 FCC B >1G 3 M peak
1.008 GHz	58.85 Pk	3.05 / 24.23 / 40.4 / 0.06	45.79	H / 1.00 / 201	n/a	-28.21
1.008 GHz	48.17 Av	3.05 / 24.23 / 40.4 / 0.06	35.11	H / 1.00 / 201	-18.89	n/a
2.317 GHz	69.65 Pk	4.12 / 28.34 / 43.8 / 0.58	58.9	V / 1.00 / 273	n/a	-15.1
2.317 GHz	63.99 Av	4.12 / 28.35 / 43.8 / 0.58	53.24	V / 1.00 / 271	-0.76	n/a
ch 11 2.46 GHz.						
1.008 GHz	59.3 Pk	3.05 / 24.23 / 40.4 / 0.06	46.24	H / 1.00 / 200	n/a	-27.76
1.008 GHz	48.12 Av	3.05 / 24.23 / 40.4 / 0.06	35.06	H / 1.00 / 271	-18.94	n/a
2.342 GHz	70.85 Pk	4.14 / 28.4 / 43.71 / 0.78	60.47	V / 1.00 / 275	n/a	-13.53
2.342 GHz	64.19 Av	4.14 / 28.4 / 43.71 / 0.78	53.81	V / 1.00 / 275	-0.19	n/a
4.924 GHz	65.9 Pk	6.61 / 32.91 / 43.64 / 0.65	62.42	V / 1.60 / 96	n/a	-11.58
4.924 GHz	53.53 Av	6.61 / 32.91 / 43.64 / 0.65	50.05	V / 1.60 / 96	-3.95	n/a
4.924 GHz	62.95 Pk	6.61 / 32.91 / 43.64 / 0.65	59.47	V / 1.85 / 44	n/a	-14.53
4.924 GHz	51.71 Av	6.61 / 32.91 / 43.64 / 0.65	48.23	H / 1.85 / 44	-5.77	n/a
54Mbps, power setting 45, emissions maximized						
5dBi antenna						
ch 1 2.4 GHz						
4.824 GHz	56.35 Pk	6.51 / 32.72 / 43.57 / 0.59	52.6	V / 1.26 / 97	n/a	-21.4
4.824 GHz	48.83 Av	6.51 / 32.72 / 43.57 / 0.59	45.08	V / 1.26 / 97	-8.92	n/a
4.824 GHz	53.2 Pk	6.51 / 32.72 / 43.57 / 0.59	49.45	H / 1.80 / 49	n/a	-24.55
4.824 GHz	45.97 Av	6.51 / 32.72 / 43.57 / 0.59	42.22	H / 1.80 / 49	-11.78	n/a
1.008 GHz	59.1 Pk	3.05 / 24.23 / 40.4 / 0.06	46.04	H / 1.00 / 203	n/a	-27.96
1.008 GHz	48.1 Av	3.05 / 24.23 / 40.4 / 0.06	35.04	H / 1.00 / 203	-18.96	n/a
2.292 GHz	65.55 Pk	4.11 / 28.29 / 43.89 / 0.5	54.55	V / 1.15 / 270	n/a	-19.45

Tested by: Robert J Behringer (Printed) _____ (Signature)

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

RADIATED EMISSIONS

Test Report #:	WC903868 Run 1	Test Area:	LTS		
EUT Model #:	50001520-01	Date:	6/3/2009		
EUT Serial #:	N/A	EUT Power:	12vdc	Temperature:	26.0 °C
Test Method:	FCC 15.247			Air Pressure:	99.0 kPa
Customer:	Digi			Rel. Humidity:	30.0 %
EUT Description:	USB/Ethernet 10/100 BaseT/WLAN Transceiver				
Notes:					
Data File Name:	3868 june 6 [gj revs].dat			Page:	5 of 8

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC B >1GHz 3m ave	DELTA2 FCC B >1G 3 M peak
2.292 GHz	61.68 Av	4.11 / 28.29 / 43.89 / 0.5	50.68	V / 1.15 / 270	-3.32	n/a
ch 6 2.43 GHz.						
2.317 GHz	66.4 Pk	4.12 / 28.34 / 43.8 / 0.58	55.65	V / 1.15 / 270	n/a	-18.35
2.317 GHz	61.16 Av	4.12 / 28.35 / 43.8 / 0.58	50.41	V / 1.15 / 270	-3.59	n/a
1.008 GHz	54.85 Pk	3.05 / 24.23 / 40.4 / 0.06	41.79	H / 1.00 / 199	n/a	-32.21
1.008 GHz	44.0 Av	3.05 / 24.23 / 40.4 / 0.06	30.94	H / 1.00 / 199	-23.06	n/a
4.874 GHz	57.0 Pk	6.56 / 32.81 / 43.61 / 0.62	53.38	V / 1.62 / 106	n/a	-20.62
4.874 GHz	49.73 Av	6.56 / 32.81 / 43.61 / 0.62	46.11	V / 1.62 / 106	-7.89	n/a
4.874 GHz	55.45 Pk	6.56 / 32.81 / 43.61 / 0.62	51.83	H / 1.73 / 51	n/a	-22.17
4.874 GHz	47.18 Av	6.56 / 32.81 / 43.61 / 0.62	43.56	H / 1.73 / 51	-10.44	n/a
ch 11 2.46 GHz.						
4.924 GHz	56.55 Pk	6.61 / 32.91 / 43.64 / 0.65	53.07	V / 1.22 / 103	n/a	-20.93
4.924 GHz	49.91 Av	6.61 / 32.91 / 43.64 / 0.65	46.43	V / 1.22 / 103	-7.57	n/a
4.924 GHz	55.75 Pk	6.61 / 32.91 / 43.64 / 0.65	52.27	H / 1.66 / 53	n/a	-21.73
4.924 GHz	47.53 Av	6.61 / 32.91 / 43.64 / 0.65	44.05	H / 1.66 / 53	-9.95	n/a
1.008 GHz	58.25 Pk	3.05 / 24.23 / 40.4 / 0.06	45.19	H / 1.00 / 200	n/a	-28.81
1.008 GHz	47.57 Av	3.05 / 24.23 / 40.4 / 0.06	34.51	H / 1.00 / 200	-19.49	n/a
2.342 GHz	67.7 Pk	4.14 / 28.4 / 43.71 / 0.78	57.32	V / 1.20 / 274	n/a	-16.68
2.342 GHz	61.91 Av	4.14 / 28.4 / 43.71 / 0.78	51.53	V / 1.20 / 274	-2.47	n/a
End of Scan 1-18 GHz						
2.39 GHz	0.0 Pk	4.18 / 28.52 / 0.0 / 0.0	32.69	H / 1.39 / 98	n/a	-41.31
2.484 GHz	0.0 Pk	4.25 / 28.74 / 0.0 / 0.0	32.98	H / 1.39 / 98	-21.02*	-41.02

Tested by: Robert J Behringer (Printed) _____ (Signature)

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

RADIATED EMISSIONS

Test Report #:	WC903868 Run 1	Test Area:	LTS		
EUT Model #:	50001520-01	Date:	6/3/2009		
EUT Serial #:	N/A	EUT Power:	12vdc	Temperature:	26.0 °C
Test Method:	FCC 15.247			Air Pressure:	99.0 kPa
Customer:	Digi			Rel. Humidity:	30.0 %
EUT Description:	USB/Ethernet 10/100 BaseT/WLAN Transceiver				
Notes:					
Data File Name:	3868 june 6 [gj revs].dat			Page:	6 of 8

List of measurements for run #: 1

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC B >1GHz 3m ave	DELTA2 FCC B >1G 3 M peak
Begin scan 18 - 25 GHz						
Analyzed all previous configurations						
No significant emissions detected						
End scan 1 - 25 GHz						

Tested by: Robert J Behringer (Printed) _____ (Signature)

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

RADIATED EMISSIONS

Test Report #:	WC903868 Run 1	Test Area:	LTS		
EUT Model #:	50001520-01	Date:	6/3/2009		
EUT Serial #:	N/A	EUT Power:	12vdc	Temperature:	26.0 °C
Test Method:	FCC 15.247			Air Pressure:	99.0 kPa
Customer:	Digi			Rel. Humidity:	30.0 %
EUT Description:	USB/Ethernet 10/100 BaseT/WLAN Transceiver				
Notes:					
Data File Name:	3868 june 6 [gj revs].dat			Page:	7 of 8

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

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC B >1GHz 3m ave
2.342 GHz	64.19 Av	4.14 / 28.4 / 43.71 / 0.78	53.81	V / 1.00 / 275	-0.19
2.317 GHz	63.99 Av	4.12 / 28.35 / 43.8 / 0.58	53.24	V / 1.00 / 271	-0.76
2.292 GHz	61.68 Av	4.11 / 28.29 / 43.89 / 0.5	50.68	V / 1.15 / 270	-3.32
4.874 GHz	53.92 Av	6.56 / 32.81 / 43.61 / 0.62	50.3	V / 1.62 / 106	-3.7
4.924 GHz	53.53 Av	6.61 / 32.91 / 43.64 / 0.65	50.05	V / 1.60 / 96	-3.95
2.342 GHz	59.47 Av	4.14 / 28.4 / 43.71 / 0.78	49.08	V / 2.07 / 11	-4.92
4.824 GHz	52.41 Av	6.51 / 32.72 / 43.57 / 0.59	48.66	V / 1.27 / 96	-5.34
2.582 GHz	56.35 Av	4.32 / 28.97 / 44.03 / 0.98	46.59	V / 2.15 / 18	-7.41
1.008 GHz	48.17 Av	3.05 / 24.23 / 40.4 / 0.06	35.11	H / 1.00 / 201	-18.89
1.011 GHz	44.18 Av	3.06 / 24.24 / 40.4 / 0.06	31.14	H / 1.00 / 204	-22.86

Tested by: Robert J Behringer (Printed) _____ (Signature)

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

RADIATED EMISSIONS

Test Report #:	WC903868 Run 1	Test Area:	LTS		
EUT Model #:	50001520-01	Date:	6/3/2009		
EUT Serial #:	N/A	EUT Power:	12vdc	Temperature:	26.0 °C
Test Method:	FCC 15.247			Air Pressure:	99.0 kPa
Customer:	Digi			Rel. Humidity:	30.0 %
EUT Description:	USB/Ethernet 10/100 BaseT/WLAN Transceiver				
Notes:					
Data File Name:	3868 june 6 [gj revs].dat			Page:	8 of 8

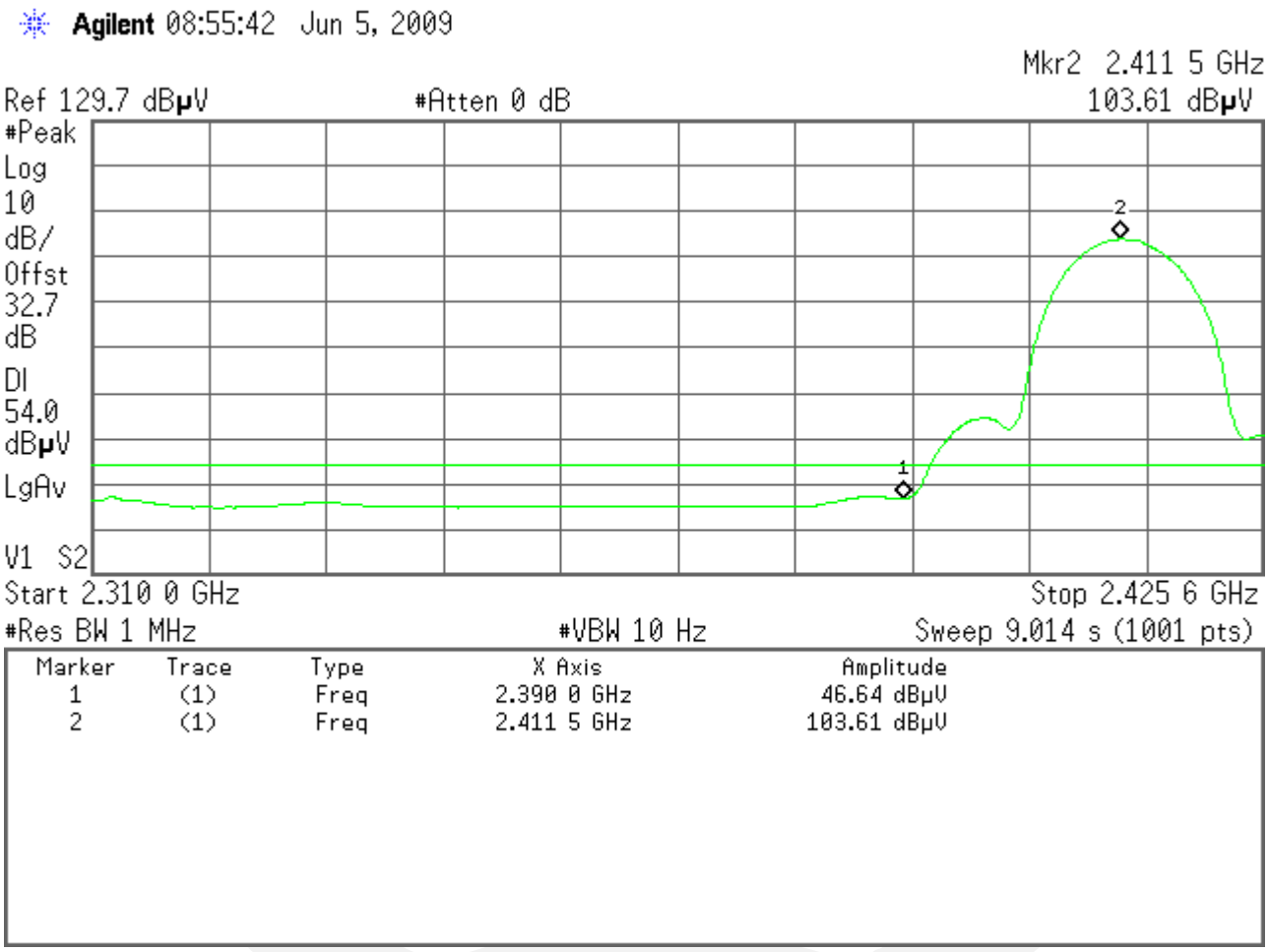
Measurement summary for limit2: FCC B >1G 3 M peak (Pk)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA2 FCC B >1G 3 M peak
4.924 GHz	65.9 Pk	6.61 / 32.91 / 43.64 / 0.65	62.42	V / 1.60 / 96	-11.58
4.874 GHz	64.25 Pk	6.56 / 32.81 / 43.61 / 0.62	60.63	V / 1.62 / 106	-13.37
2.342 GHz	70.85 Pk	4.14 / 28.4 / 43.71 / 0.78	60.47	V / 1.00 / 275	-13.53
4.824 GHz	63.4 Pk	6.51 / 32.72 / 43.57 / 0.59	59.65	V / 1.27 / 96	-14.35
2.317 GHz	69.65 Pk	4.12 / 28.34 / 43.8 / 0.58	58.9	V / 1.00 / 273	-15.1
2.342 GHz	65.7 Pk	4.14 / 28.4 / 43.71 / 0.78	55.31	V / 2.07 / 11	-18.69
2.292 GHz	65.55 Pk	4.11 / 28.29 / 43.89 / 0.5	54.55	V / 1.15 / 270	-19.45
2.582 GHz	62.9 Pk	4.32 / 28.97 / 44.03 / 0.98	53.14	V / 2.15 / 18	-20.86
1.011 GHz	59.35 Pk	3.06 / 24.24 / 40.4 / 0.06	46.31	H / 1.00 / 205	-27.69
1.008 GHz	59.35 Pk	3.05 / 24.23 / 40.4 / 0.06	46.29	H / 1.00 / 203	-27.71
2.484 GHz	0.0 Pk	4.25 / 28.74 / 0.0 / 0.0	32.98	H / 1.39 / 98	-41.02
2.39 GHz	0.0 Pk	4.18 / 28.52 / 0.0 / 0.0	32.69	H / 1.39 / 98	-41.31

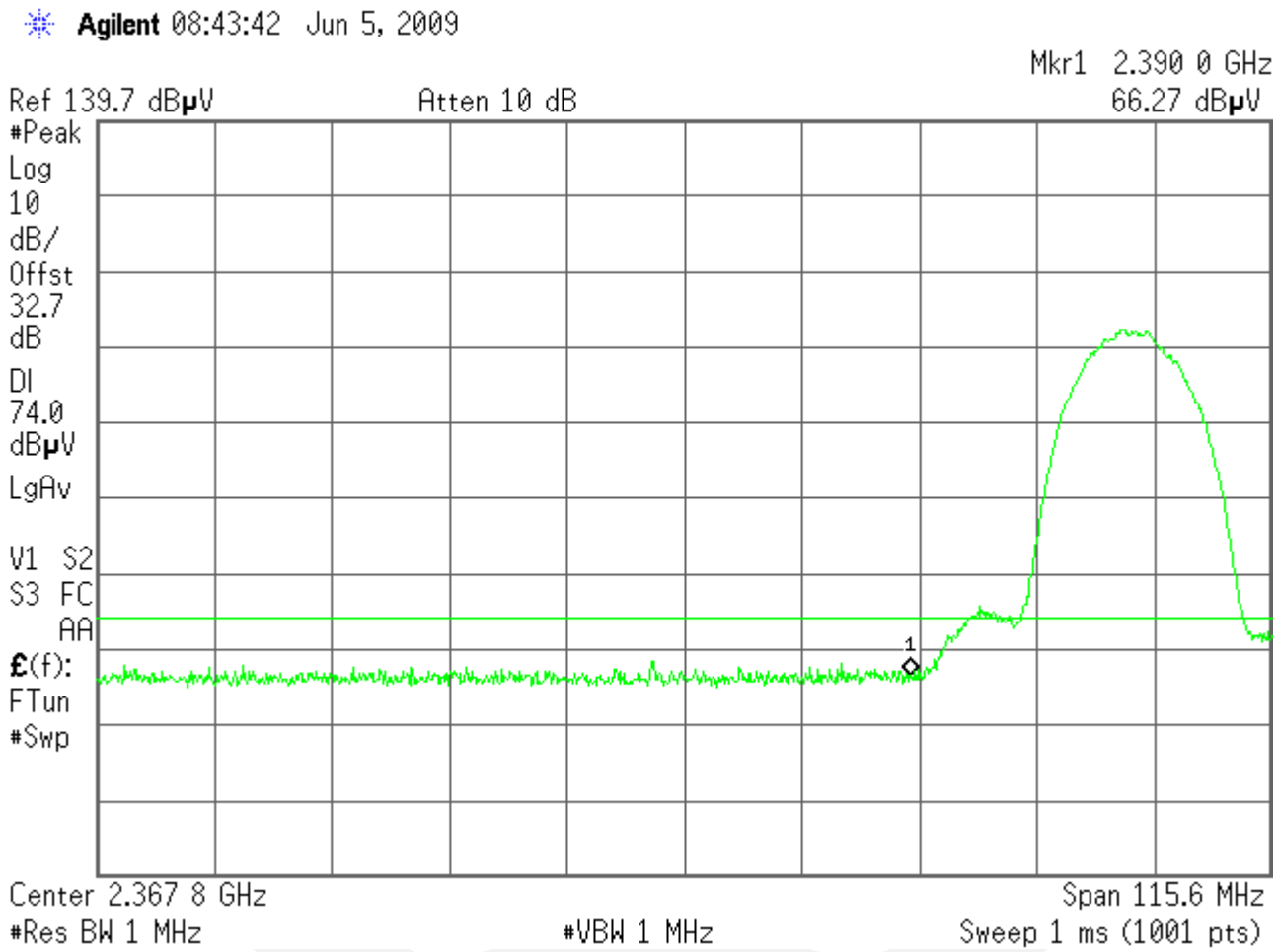
Tested by: Robert J Behringer (Printed) _____ (Signature)

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

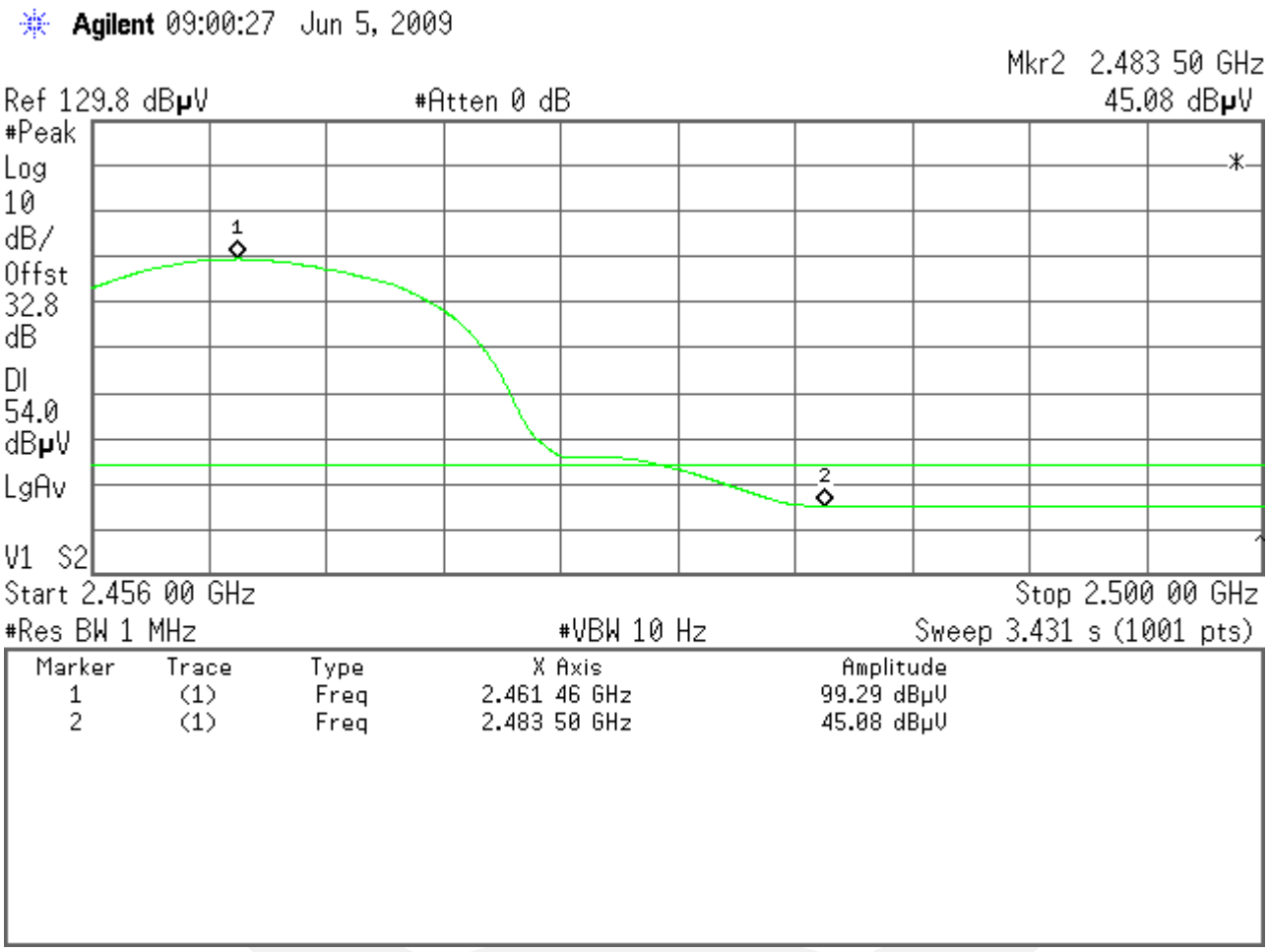
Radiated Bandedge
Channel 1, 11 Mbps, 2 dBi antenna, Average



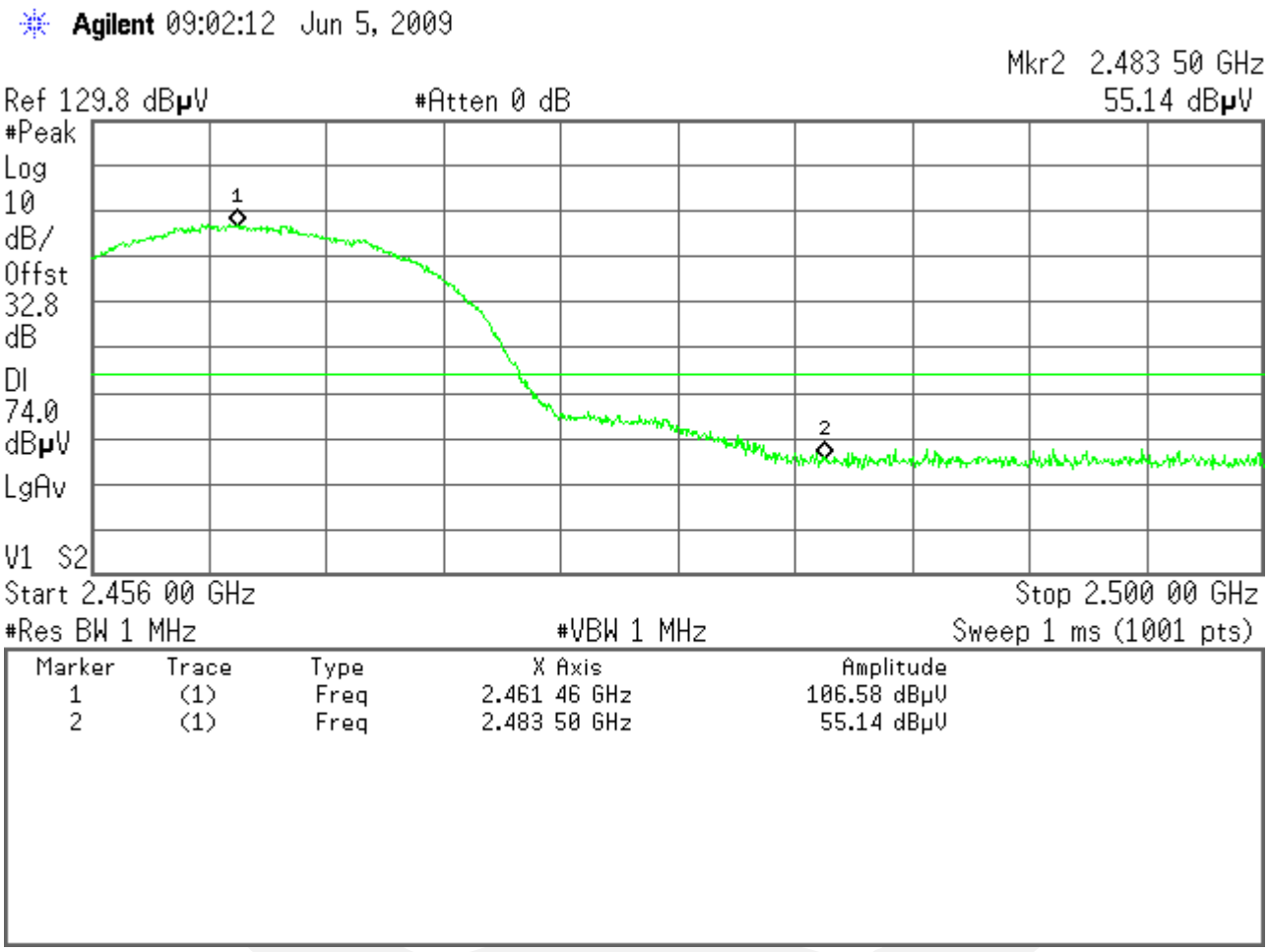
Radiated Bandedge
Channel 1, 11 Mbps, 2 dBi antenna, Peak



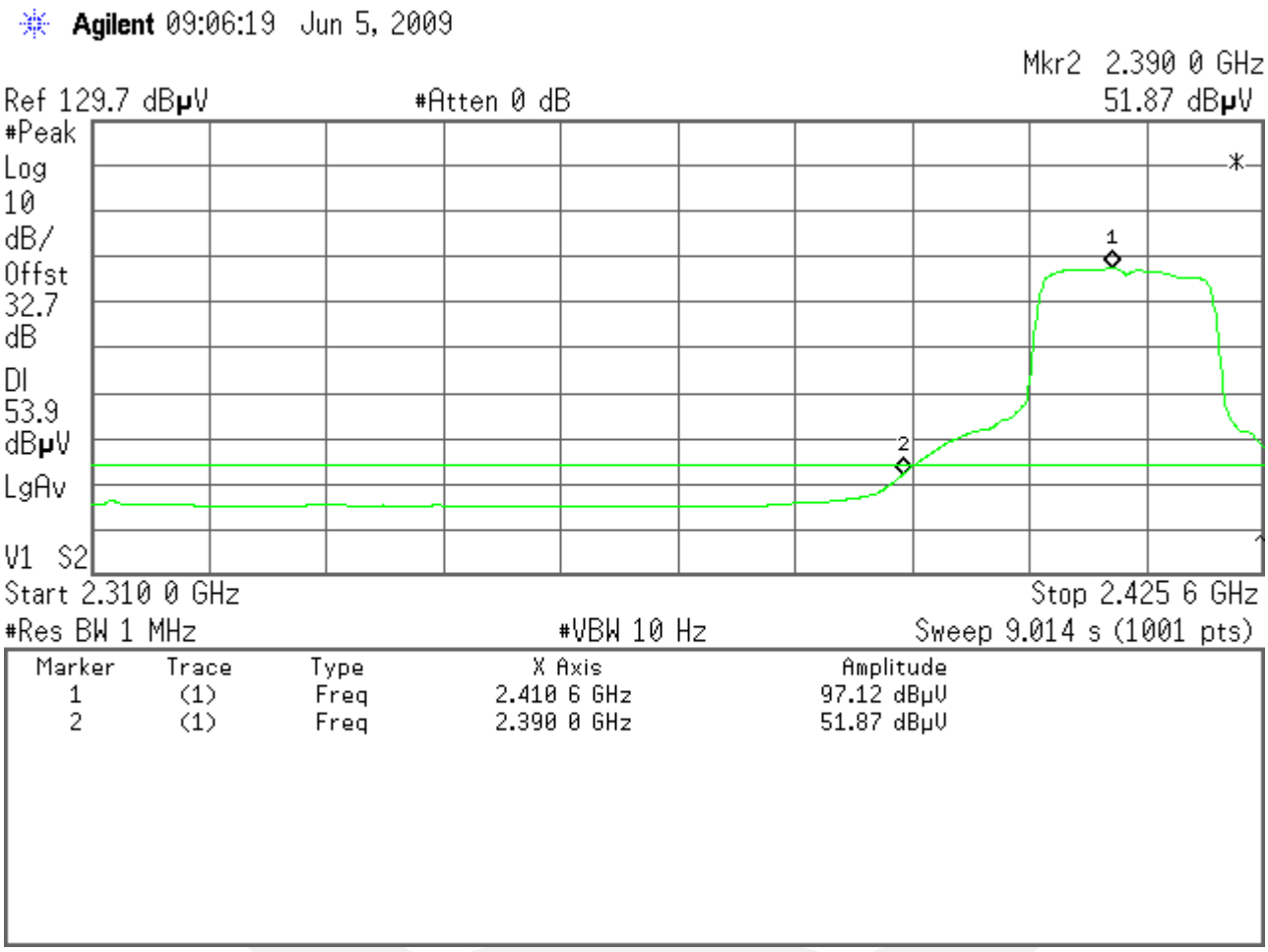
Radiated Bandedge
Channel 11, 11 Mbps, 2 dBi antenna, Average



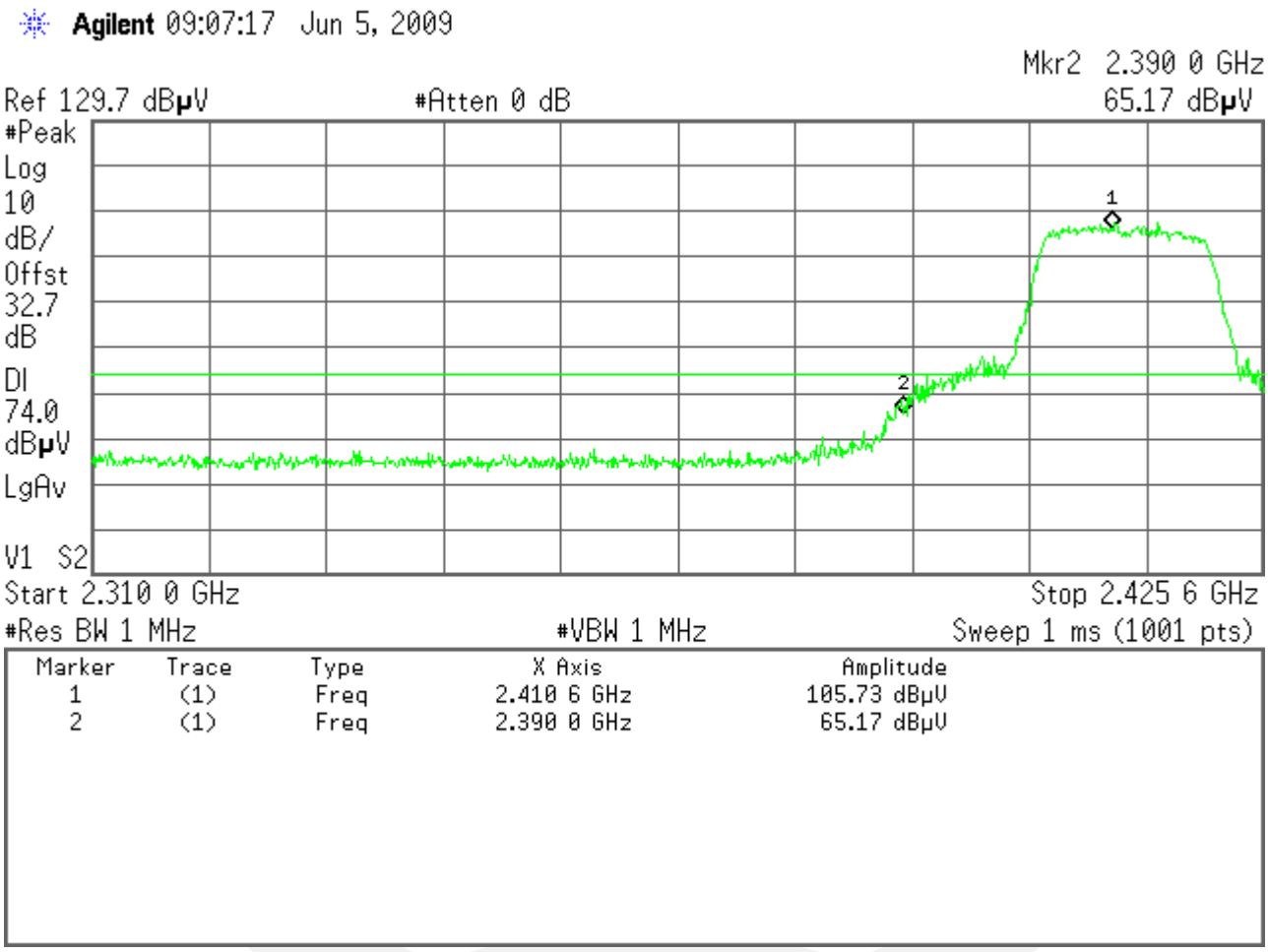
Radiated Bandedge
Channel 11, 11 Mbps, 2 dBi antenna, Peak



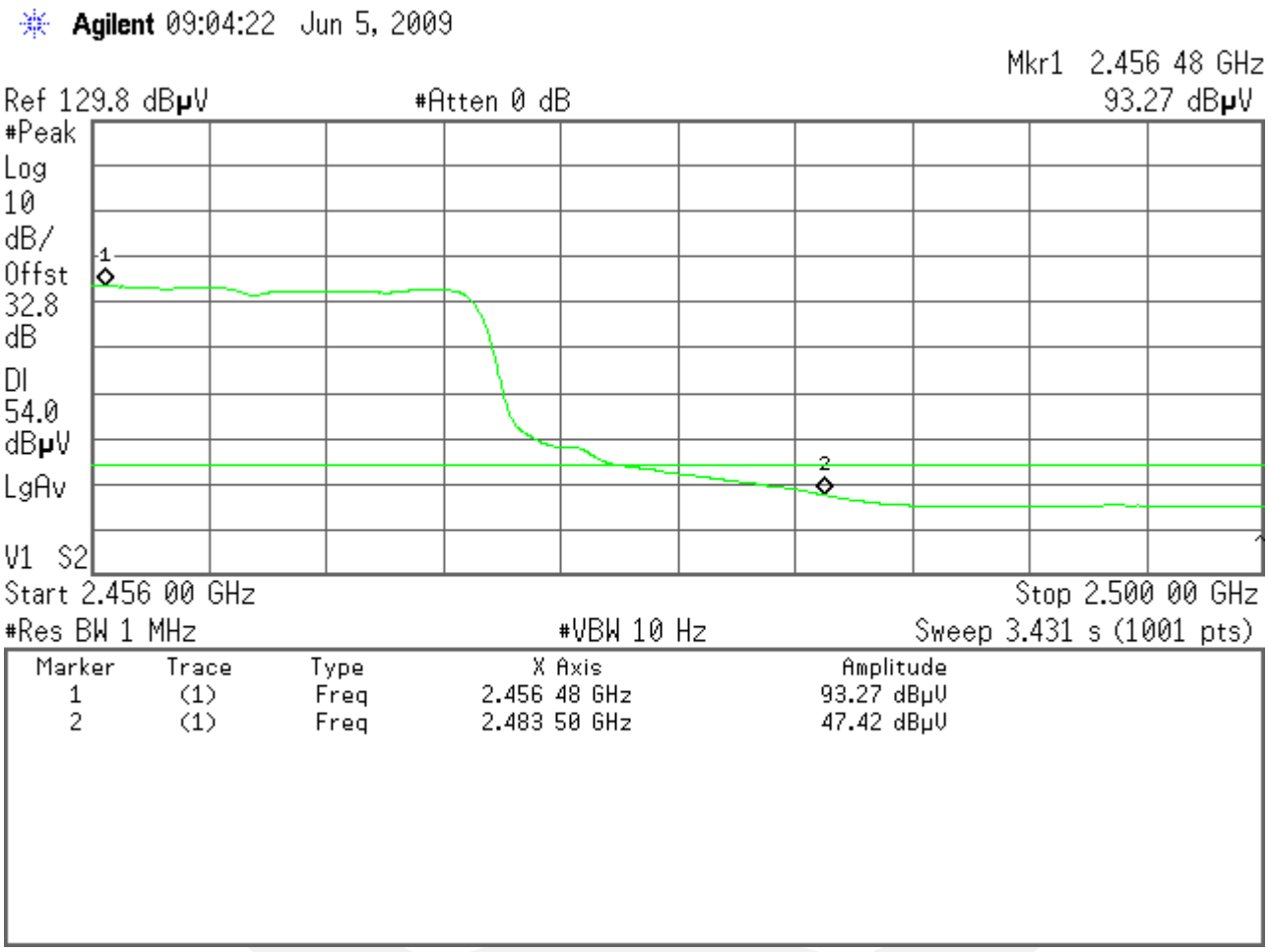
Radiated Bandedge
Channel 1, 54 Mbps, 2 dBi antenna, Average



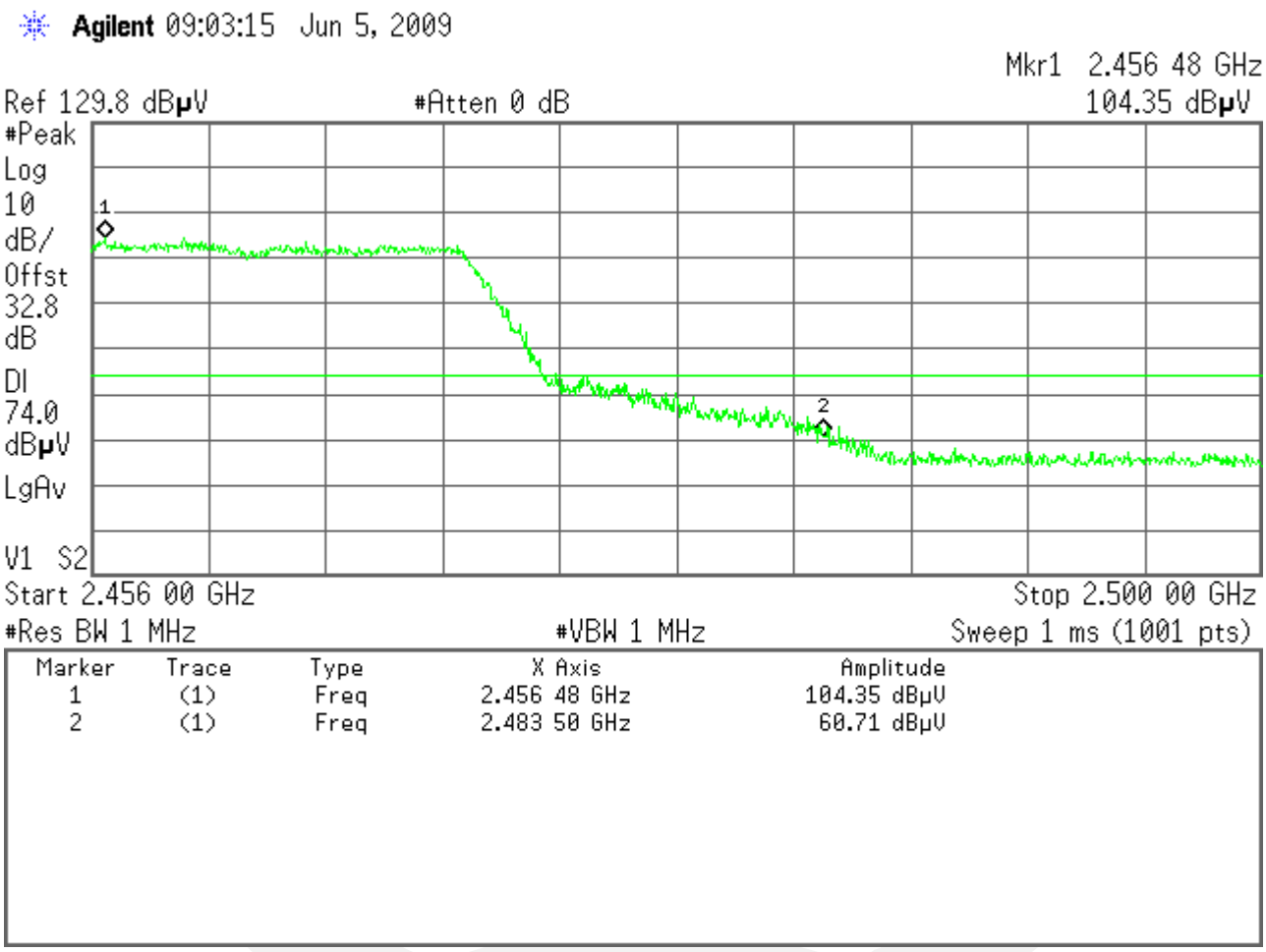
Radiated Bandedge
Channel 1, 54 Mbps, 2 dBi antenna, Peak



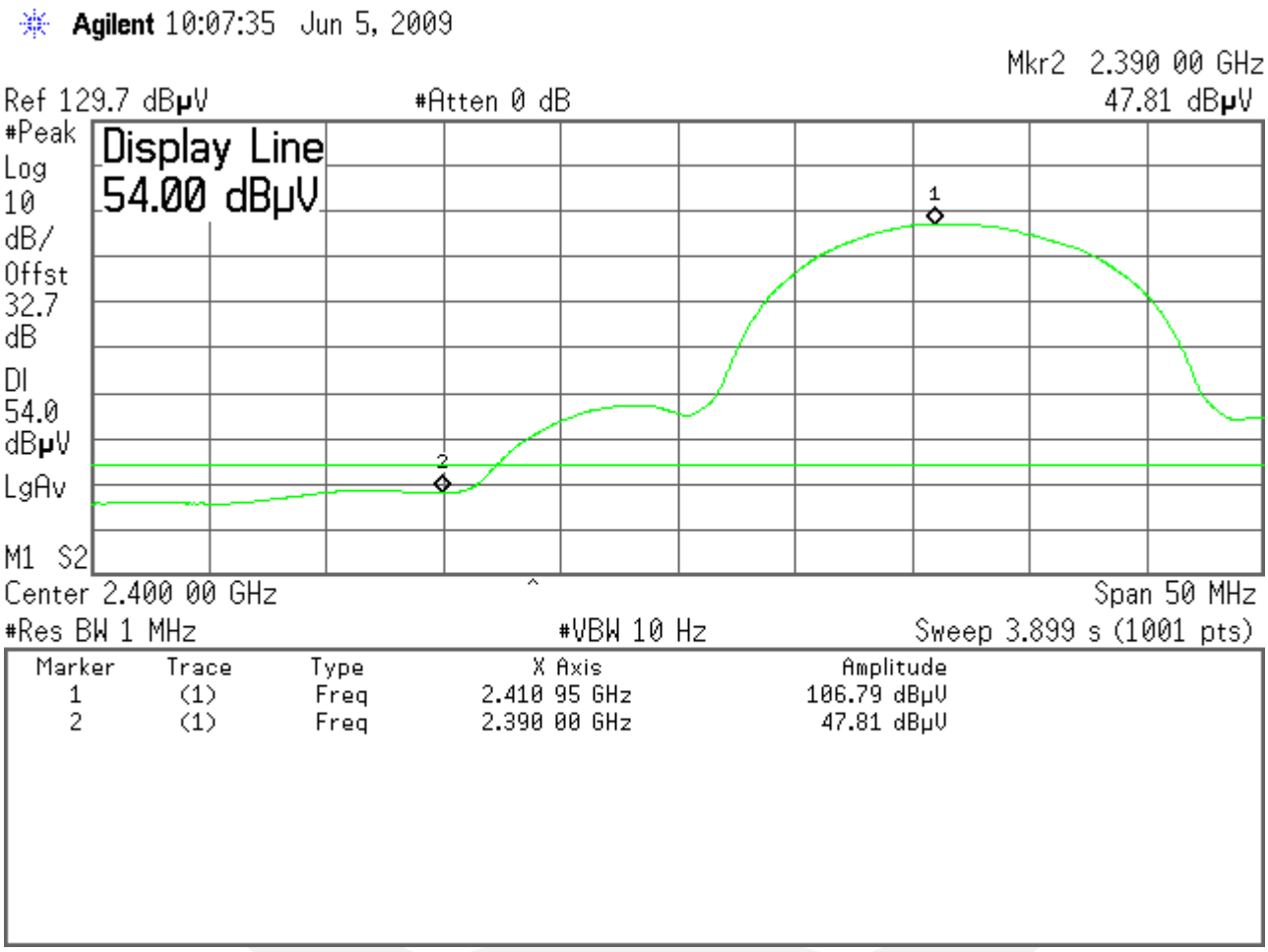
Radiated Bandedge
Channel 11, 54 Mbps, 2 dBi antenna, Average



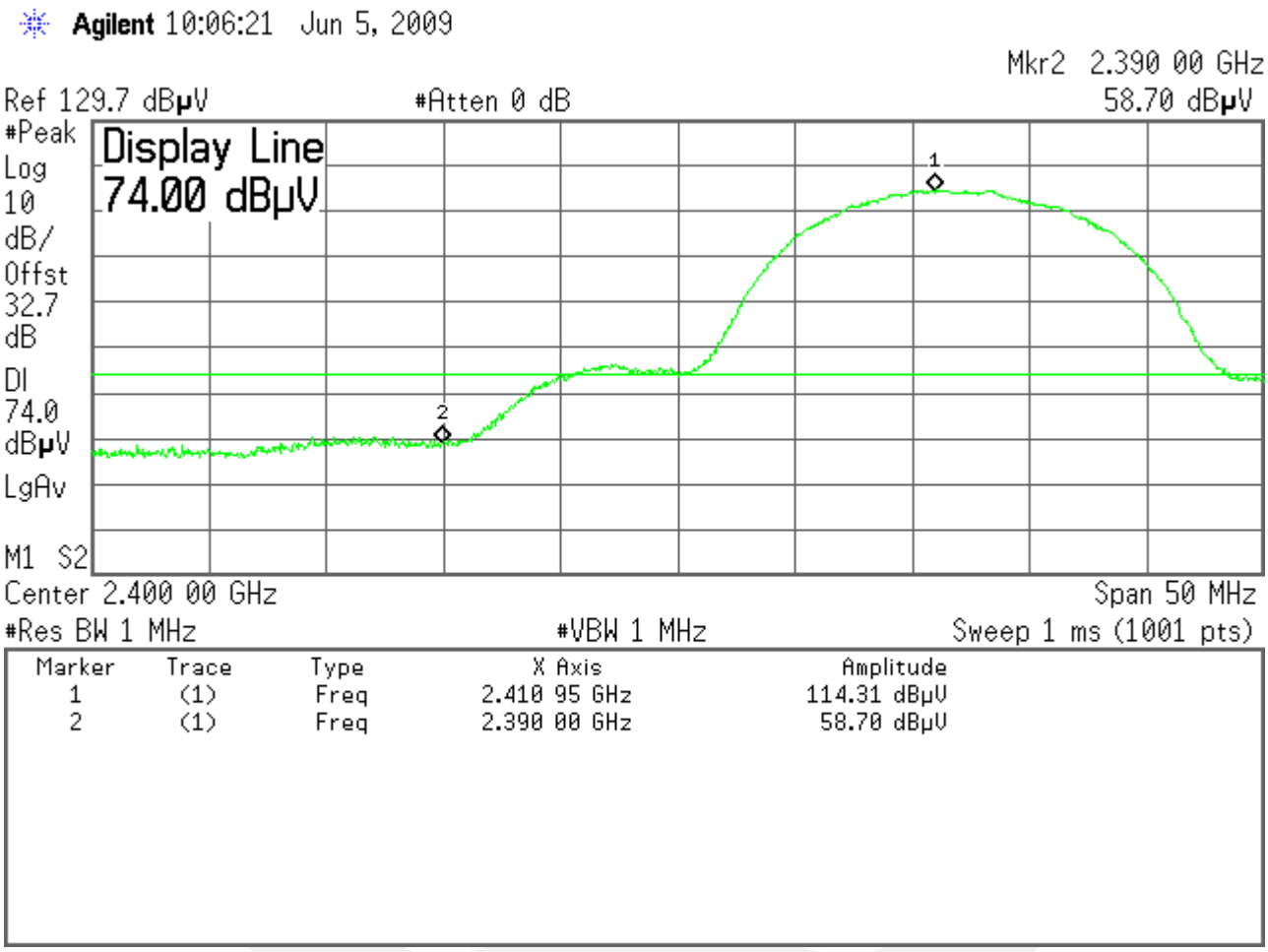
Radiated Bandedge
Channel 11, 54 Mbps, 2 dBi antenna, Peak



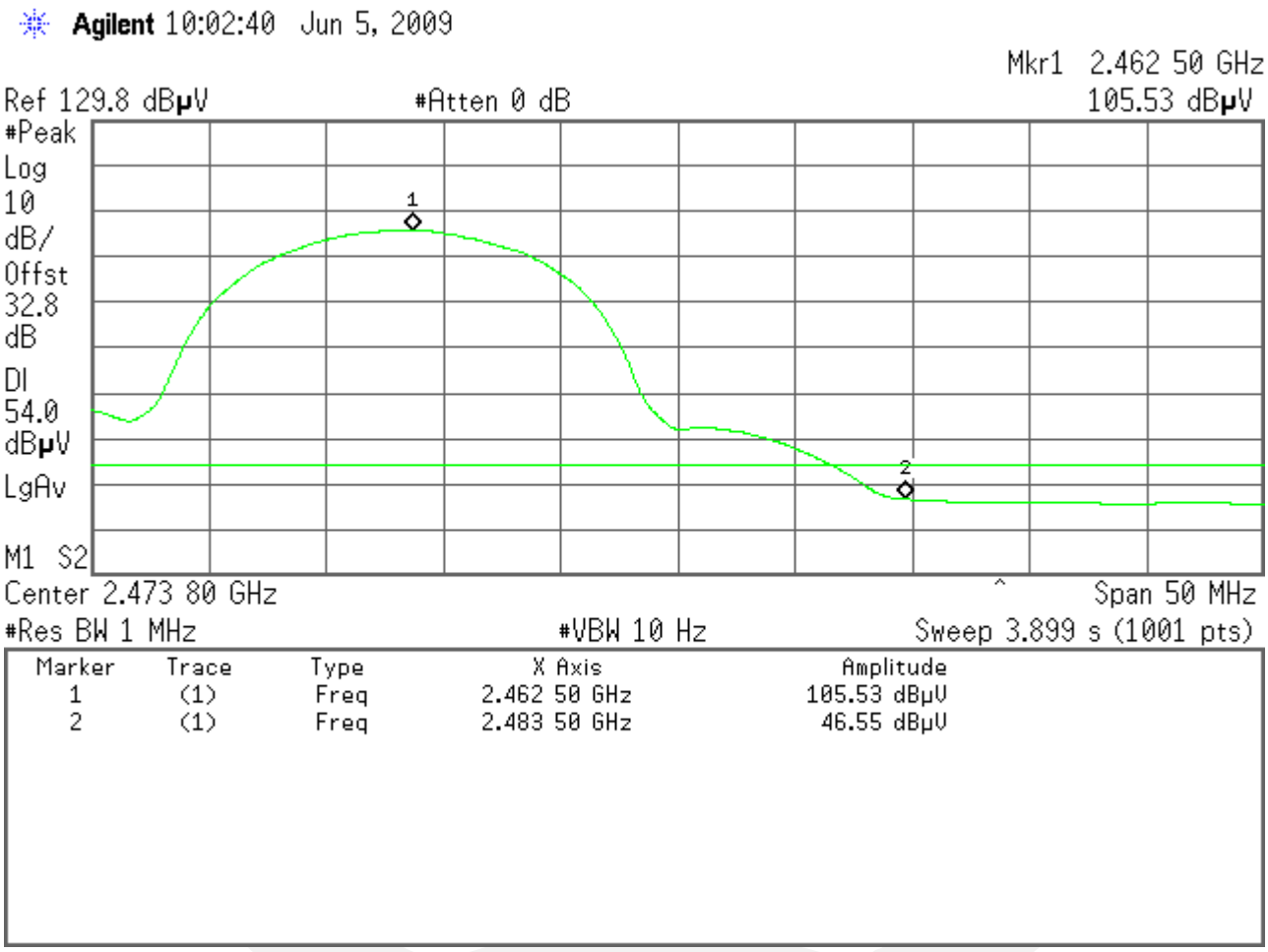
Radiated Bandedge
Channel 1, 11 Mbps, 5 dBi antenna, Average



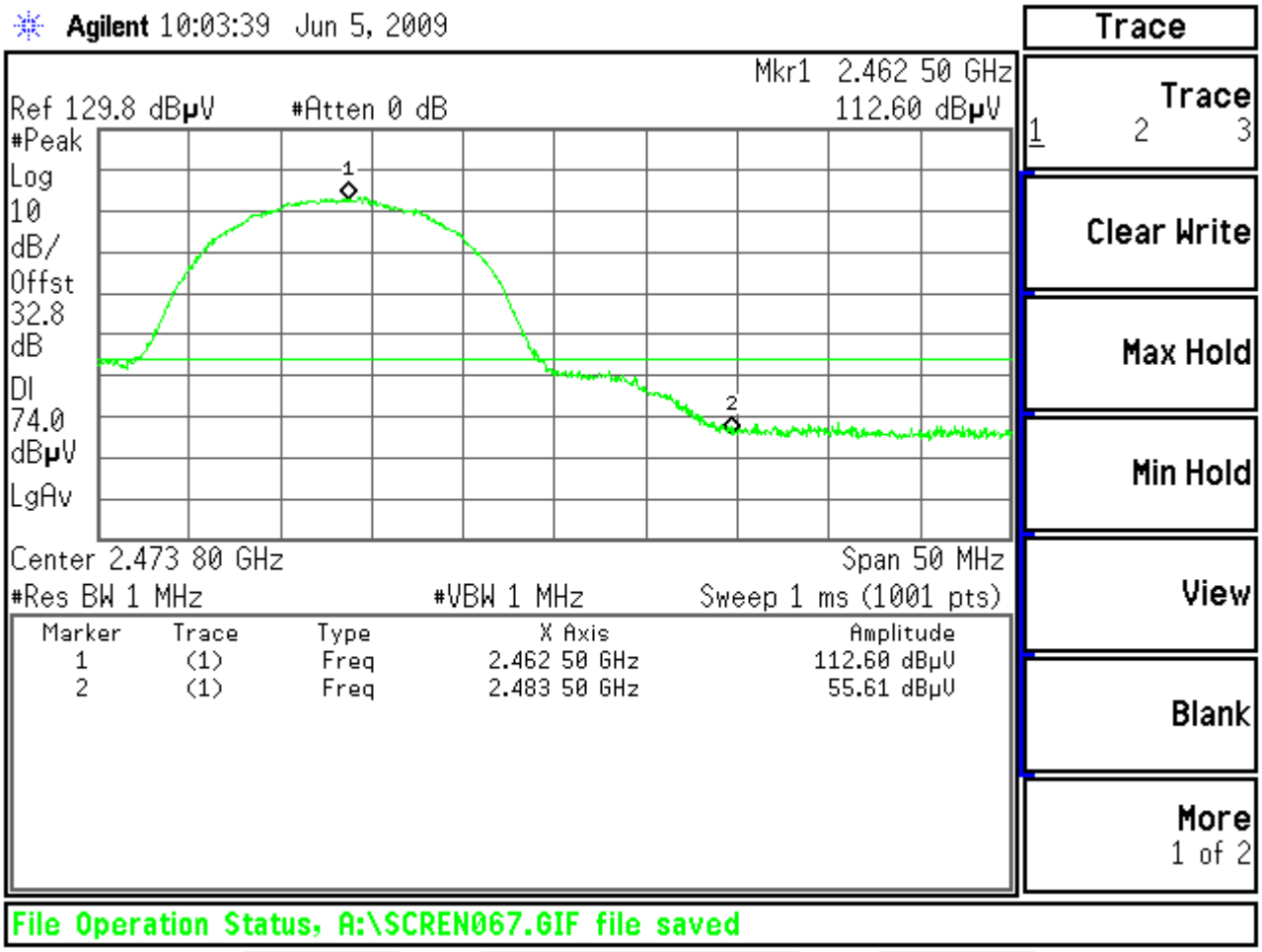
Radiated Bandedge
Channel 1, 11 Mbps, 5 dBi antenna, Peak



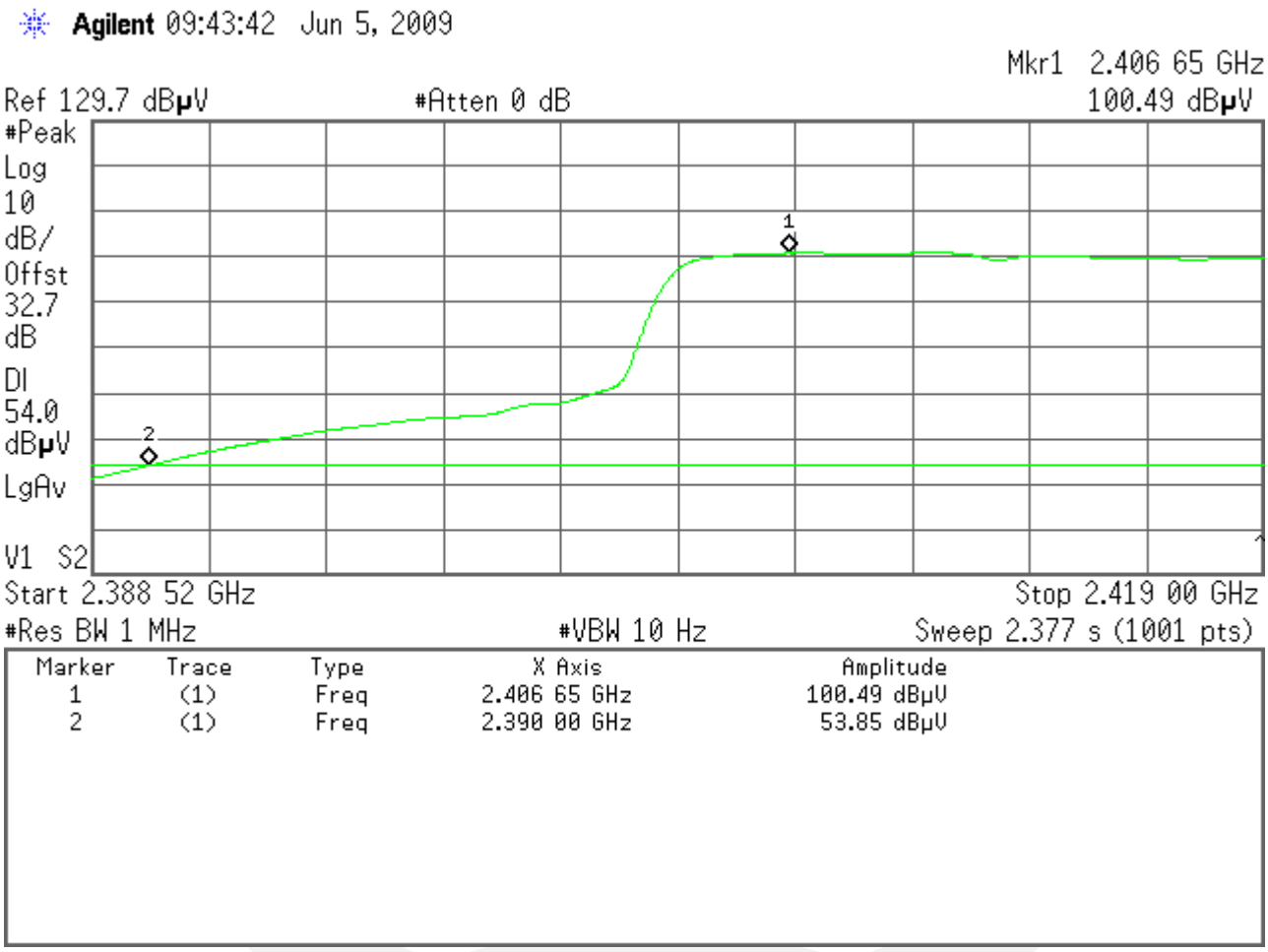
Radiated Bandedge
Channel 11, 11 Mbps, 5 dBi antenna, Average



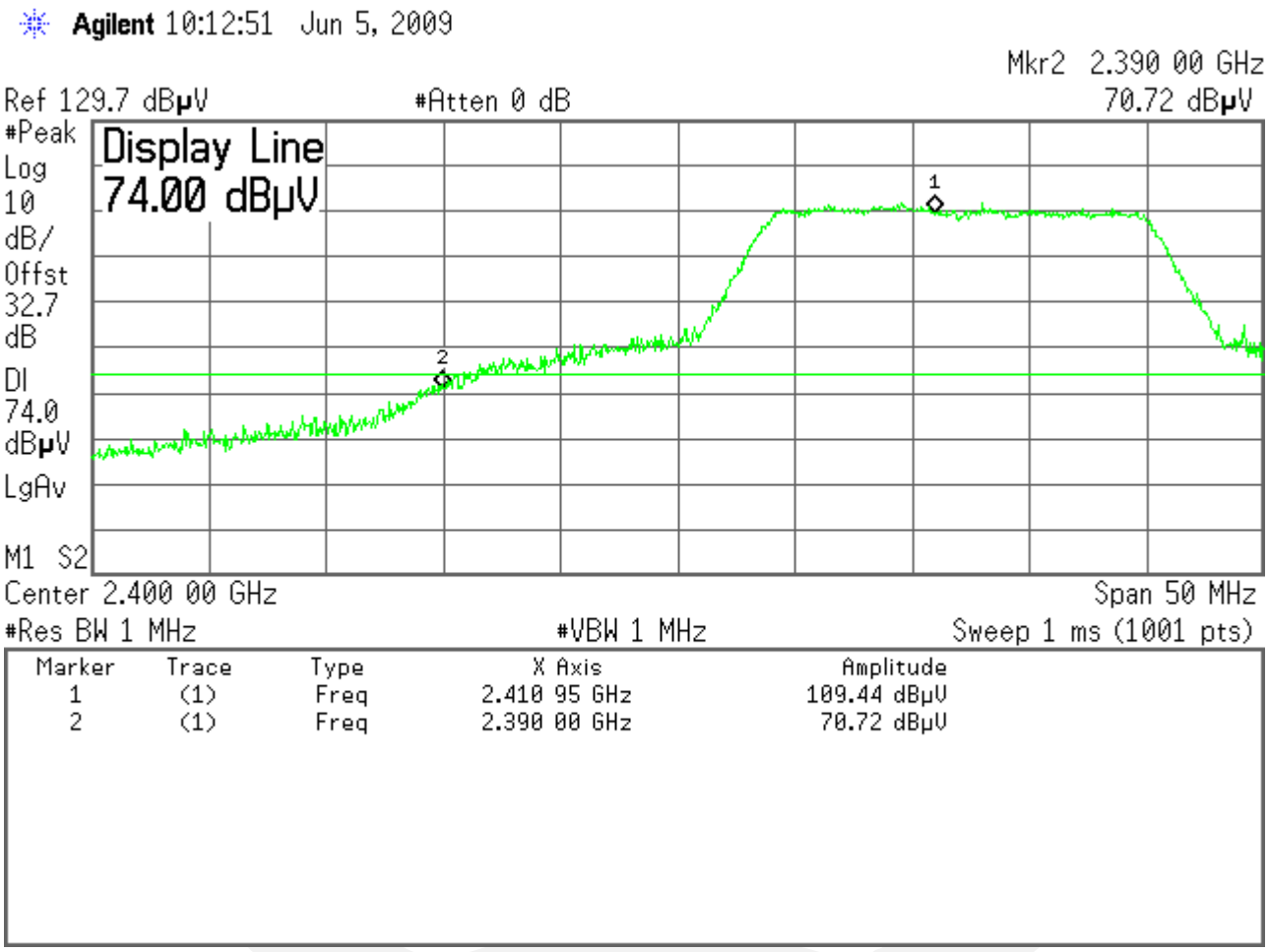
Radiated Bandedge
Channel 11, 11 Mbps, 5 dBi antenna, Peak



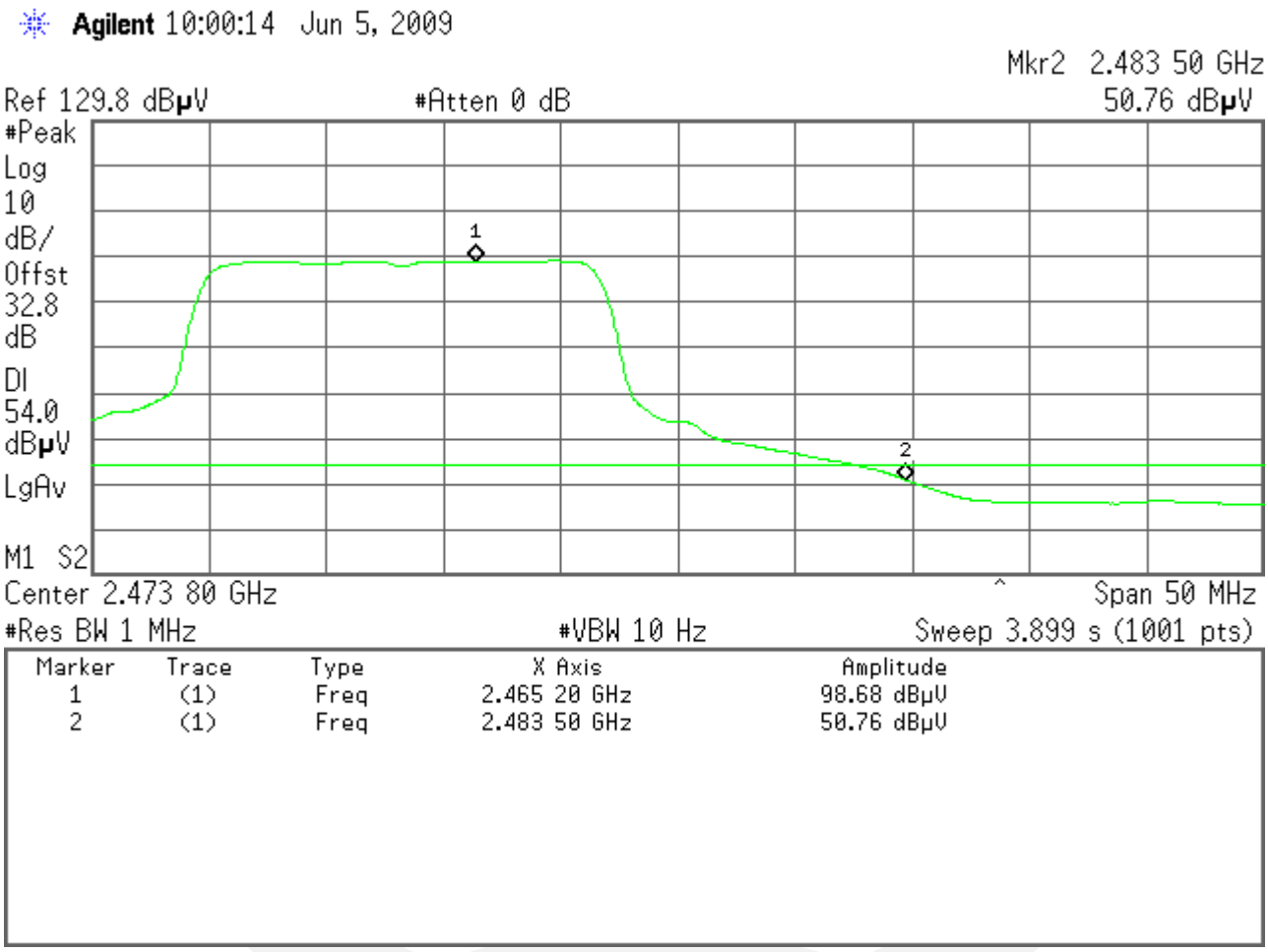
Radiated Bandedge
Channel 1, 54 Mbps, 5 dBi antenna, Average



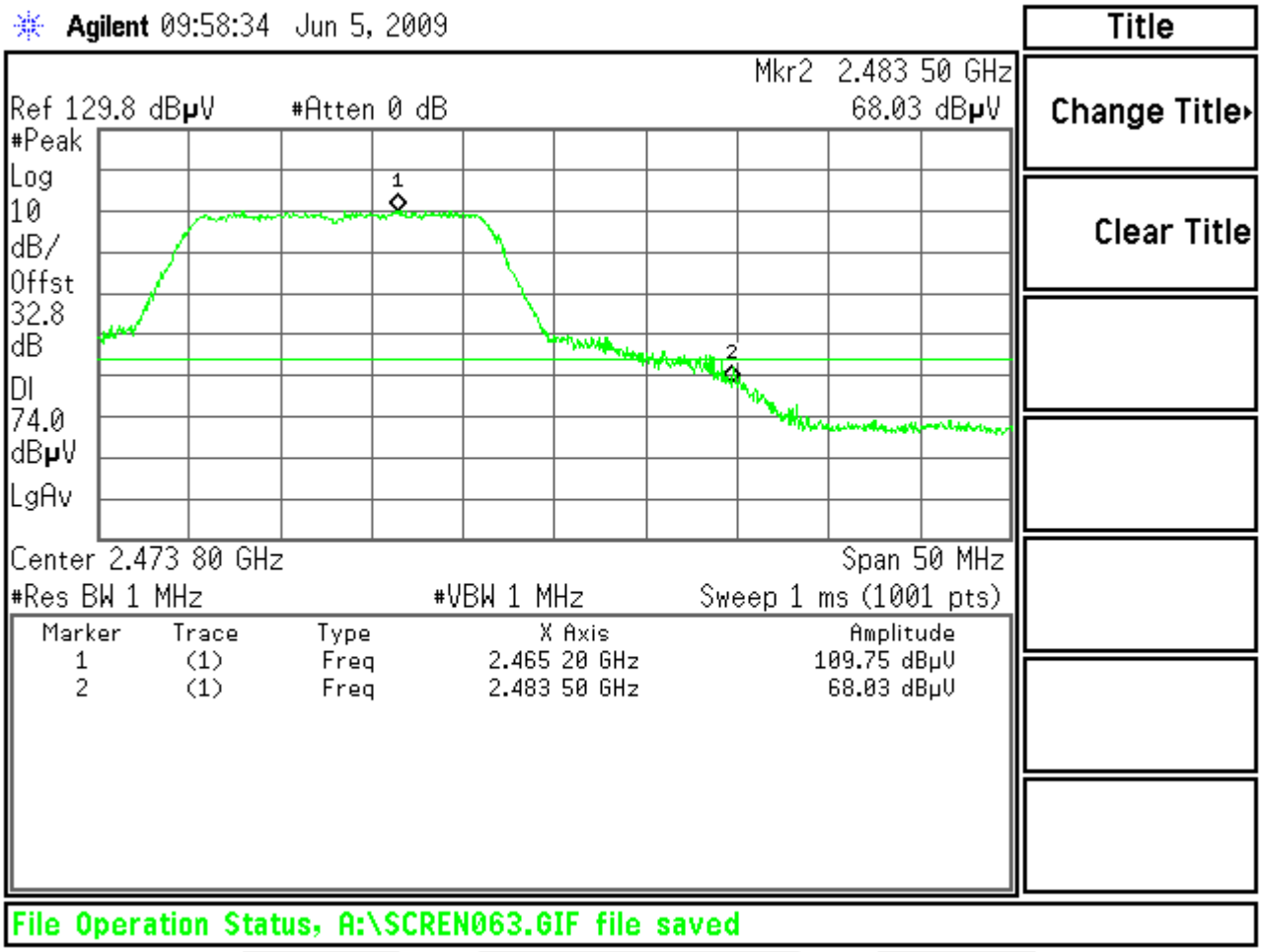
Radiated Bandedge
Channel 1, 54 Mbps, 5 dBi antenna, Peak



Radiated Bandedge
Channel 11, 54 Mbps, 5 dBi antenna, Average



Radiated Bandedge
Channel 11, 54 Mbps, 5 dBi antenna, Peak



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

Test summary
The requirements are: ■ - MET ☐ - NOT MET
Test was performed in accordance with the test procedure of FCC KDB Publication 558074
Maximum power spectral density is –4.61 dBm / 3 kHz
Power setting 45

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

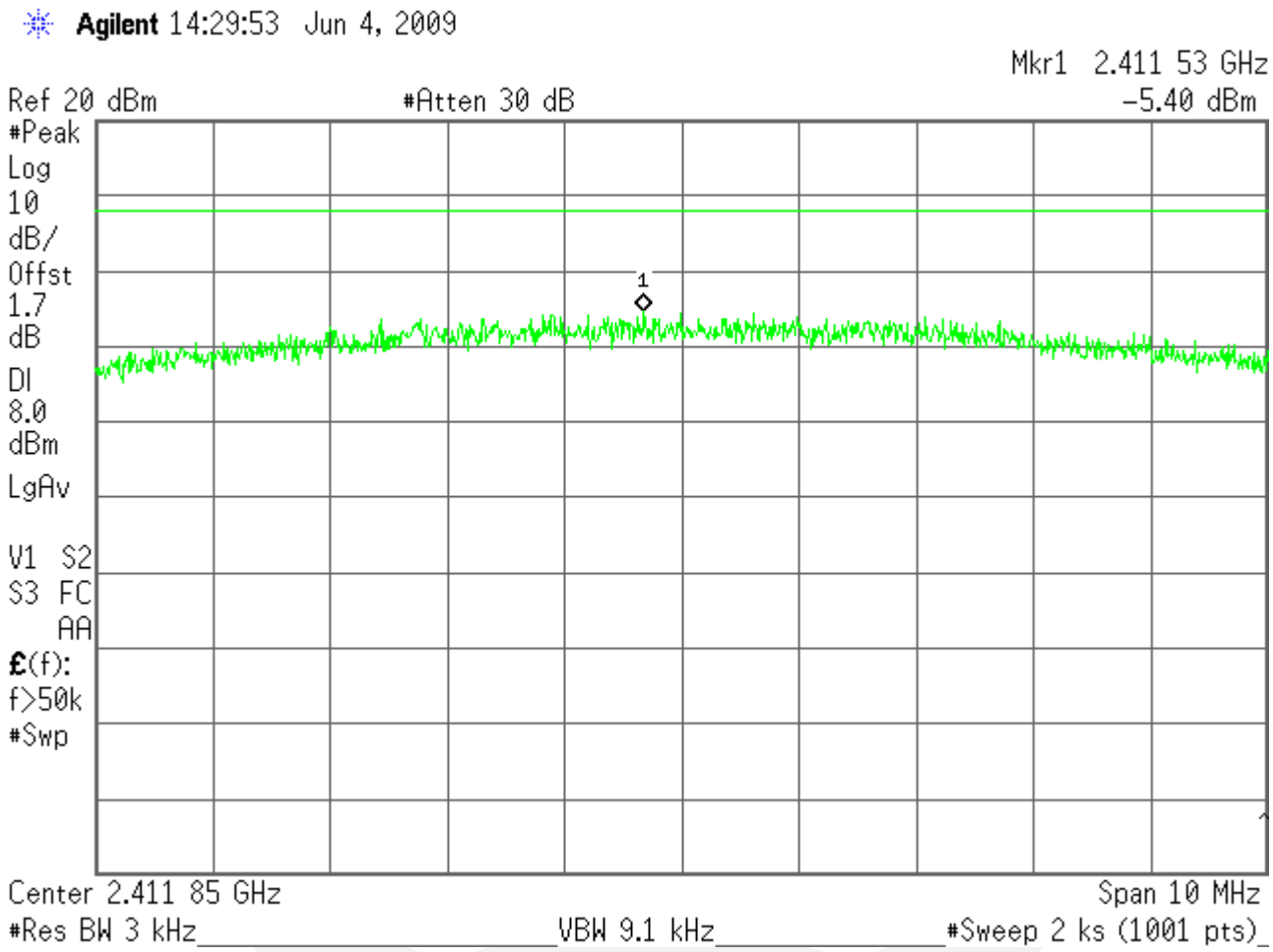
Test equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Due
NBLE03367	E4440A	Agilent	Spectrum Analyzer	MY42510439	20-Nov-09

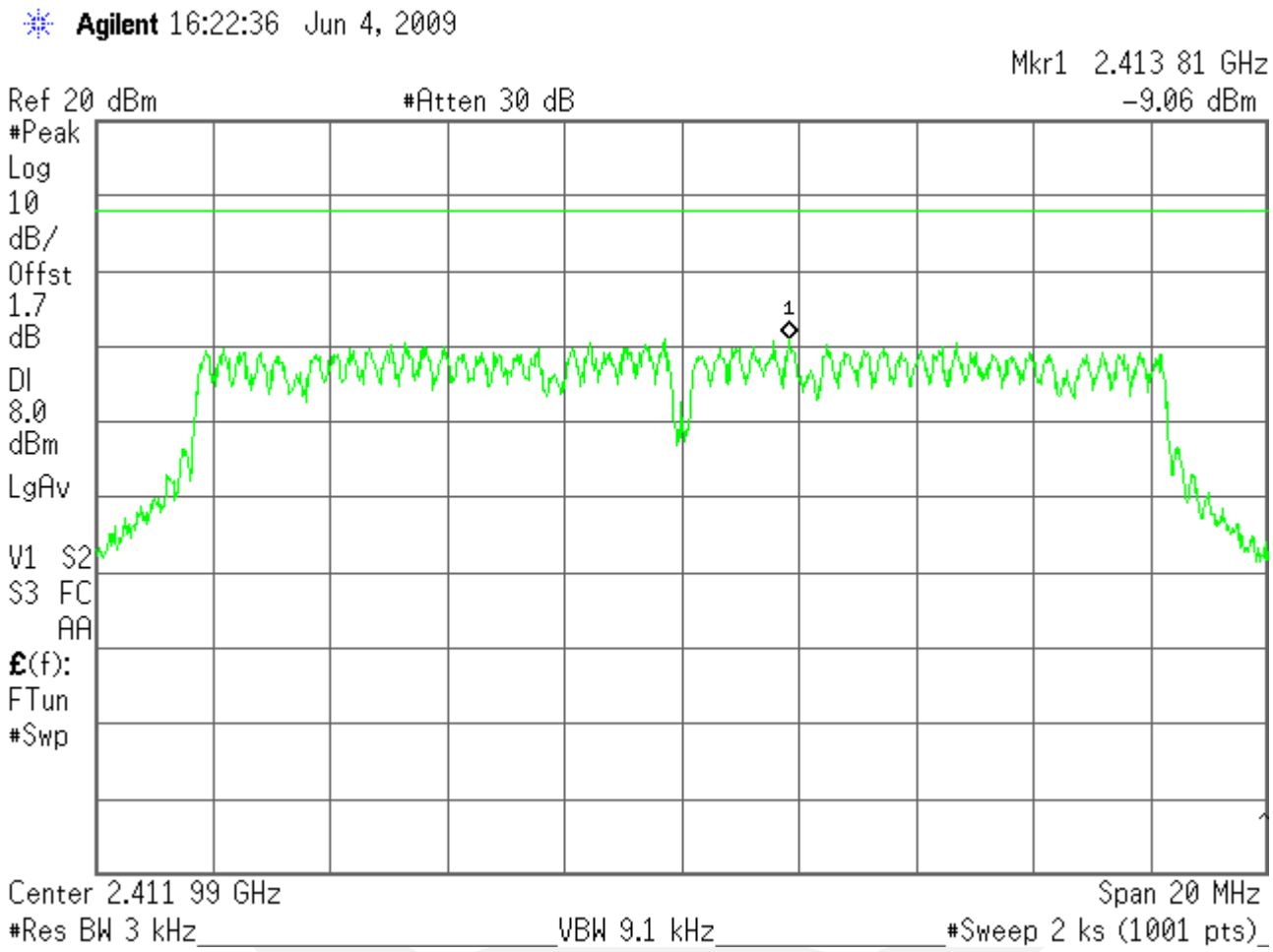
Test limit
No greater than 8 dBm in any 3 kHz band

Test data
See following pages.

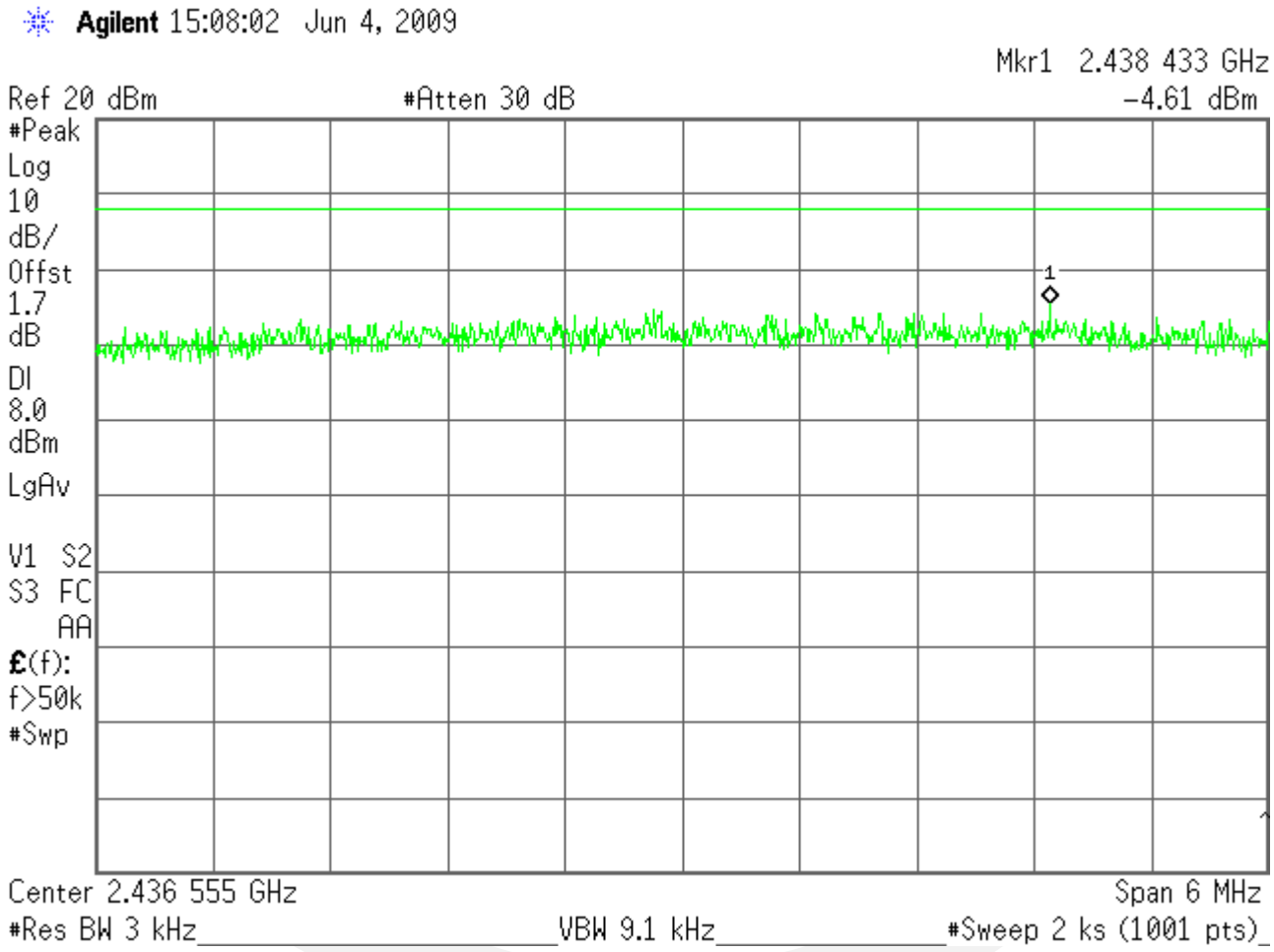
Power spectral density
Channel 1, 11 Mbps



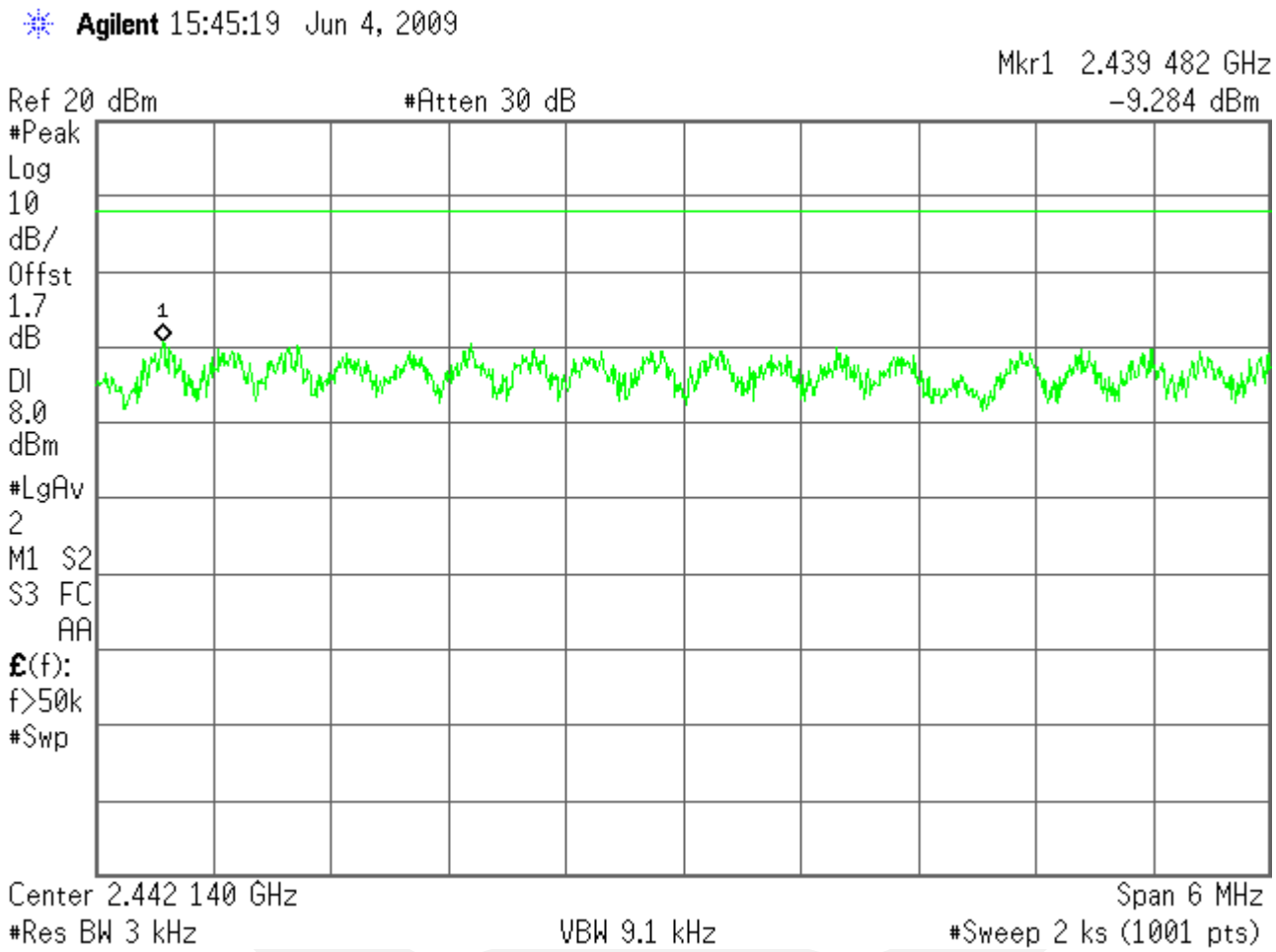
Power spectral density
Channel 1, 54 Mbps



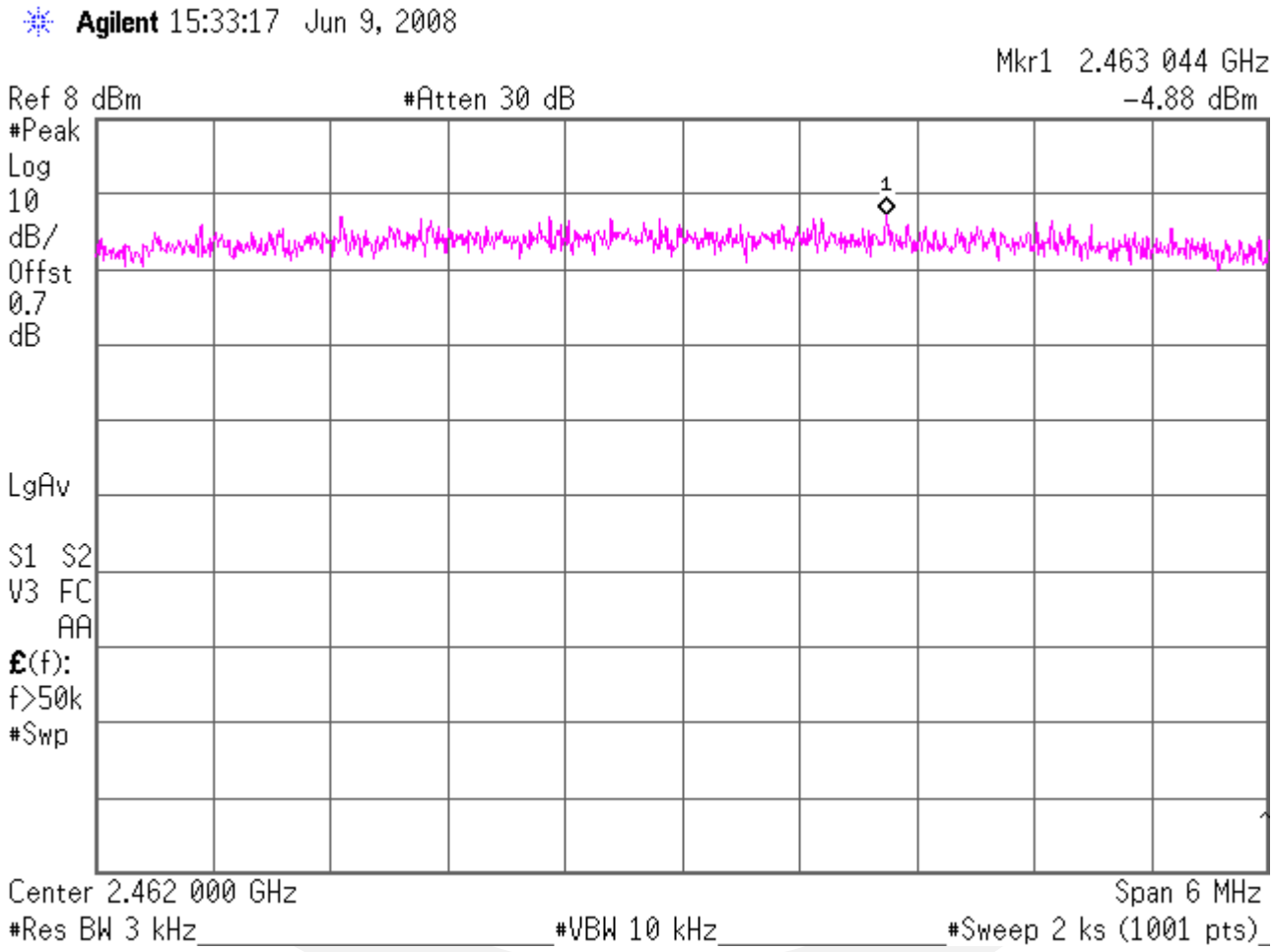
Power spectral density
Channel 6, 11 Mbps



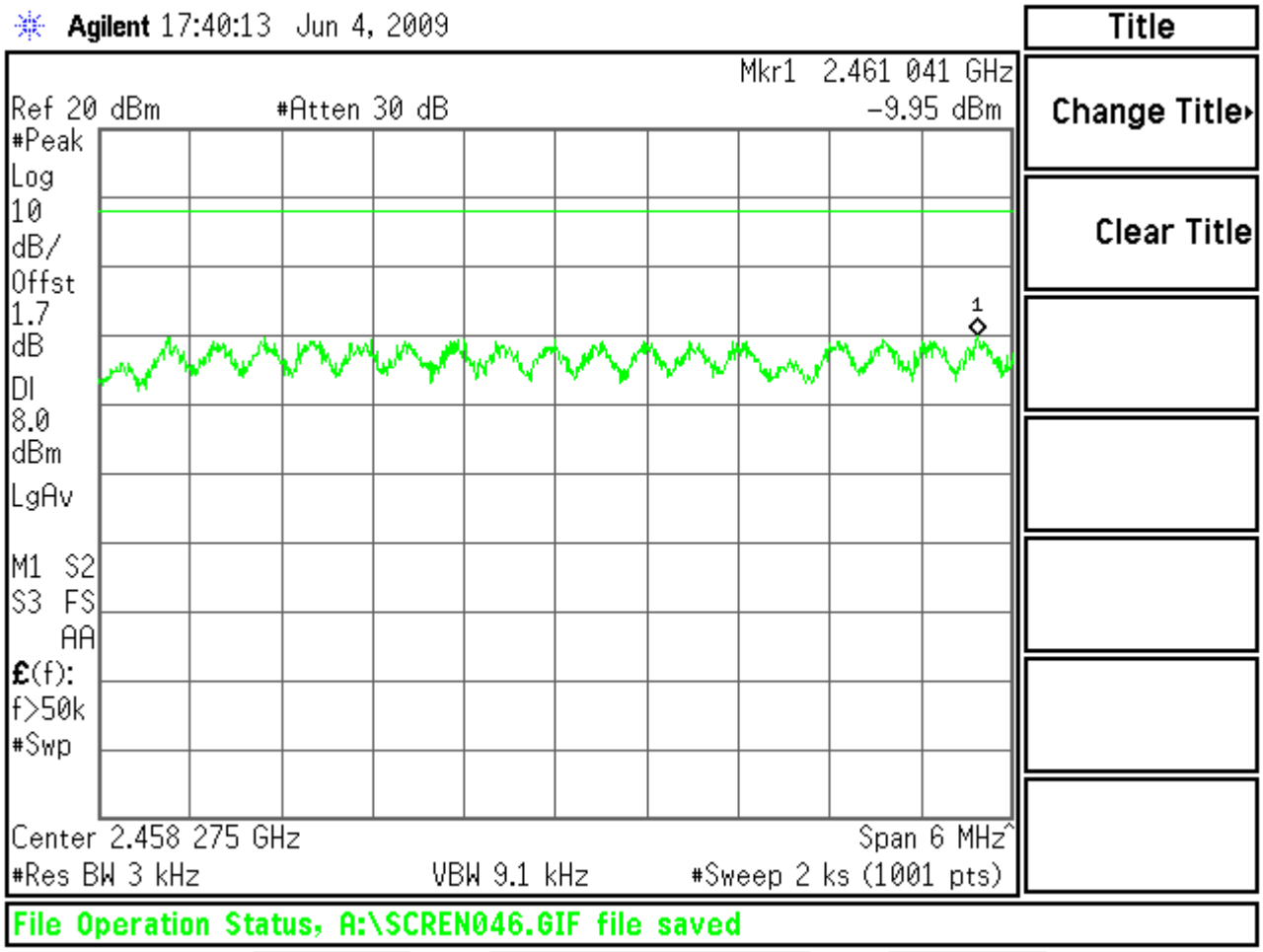
Power spectral density
Channel 6, 54 Mbps



Power spectral density
Channel 11, 11 Mbps



Power spectral density
Channel 11, 54 Mbps



99% Bandwidth
IC RSS-GEN 4.6

Test summary
The requirements are: ■ - MET ☐ - NOT MET
Test was performed in accordance with the article “The Measurement of Occupied Bandwidth” by Industry Canada’s certification bureau
99% Occupied bandwidth range is from 12.0 MHz to 16.6 MHz.

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

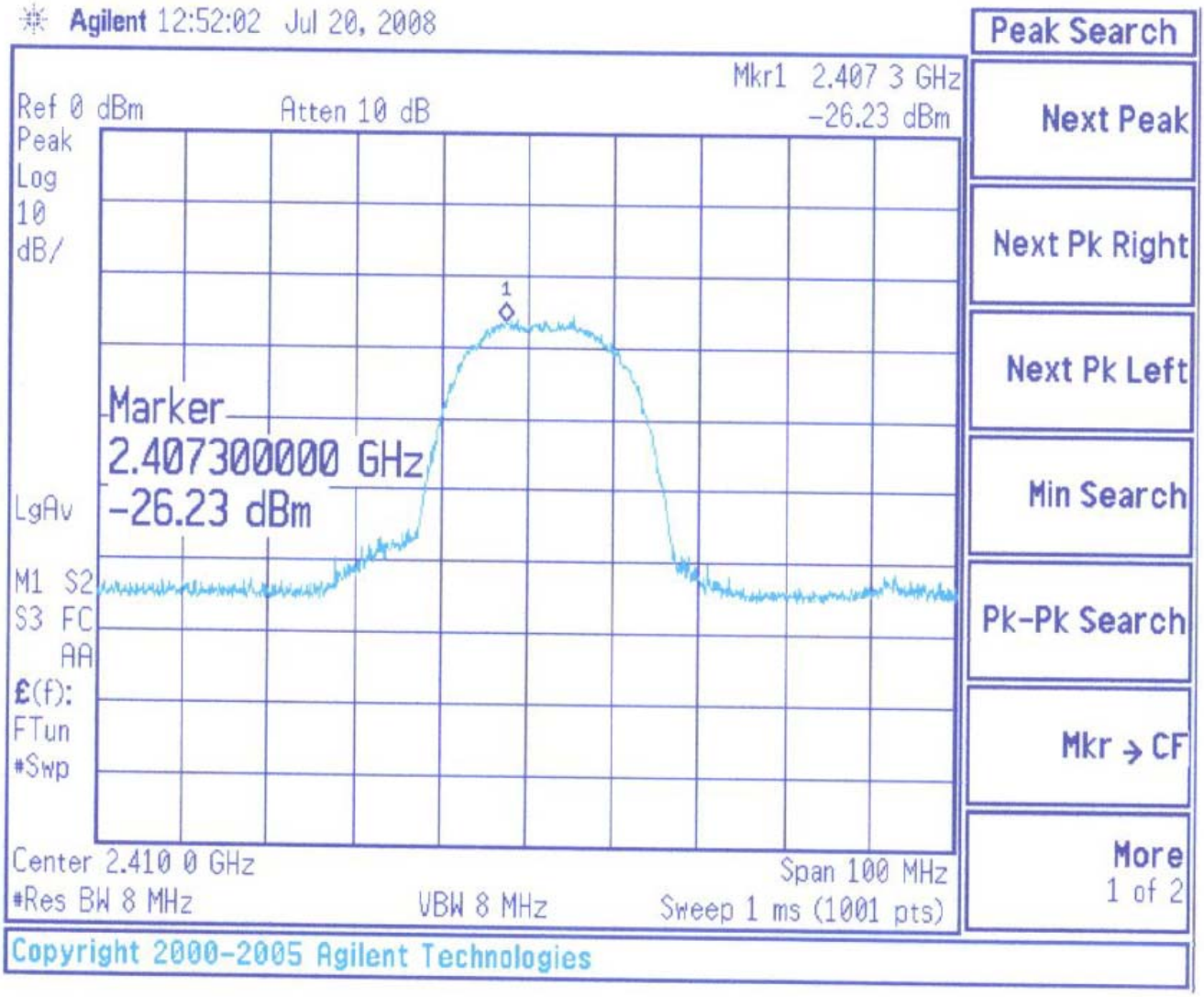
Test equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Due
WRLE03371	E4440A	Agilent	Spectrum Analyzer	MY43362222	14-Nov-09

Test limit
Not applicable

Test data
See following pages

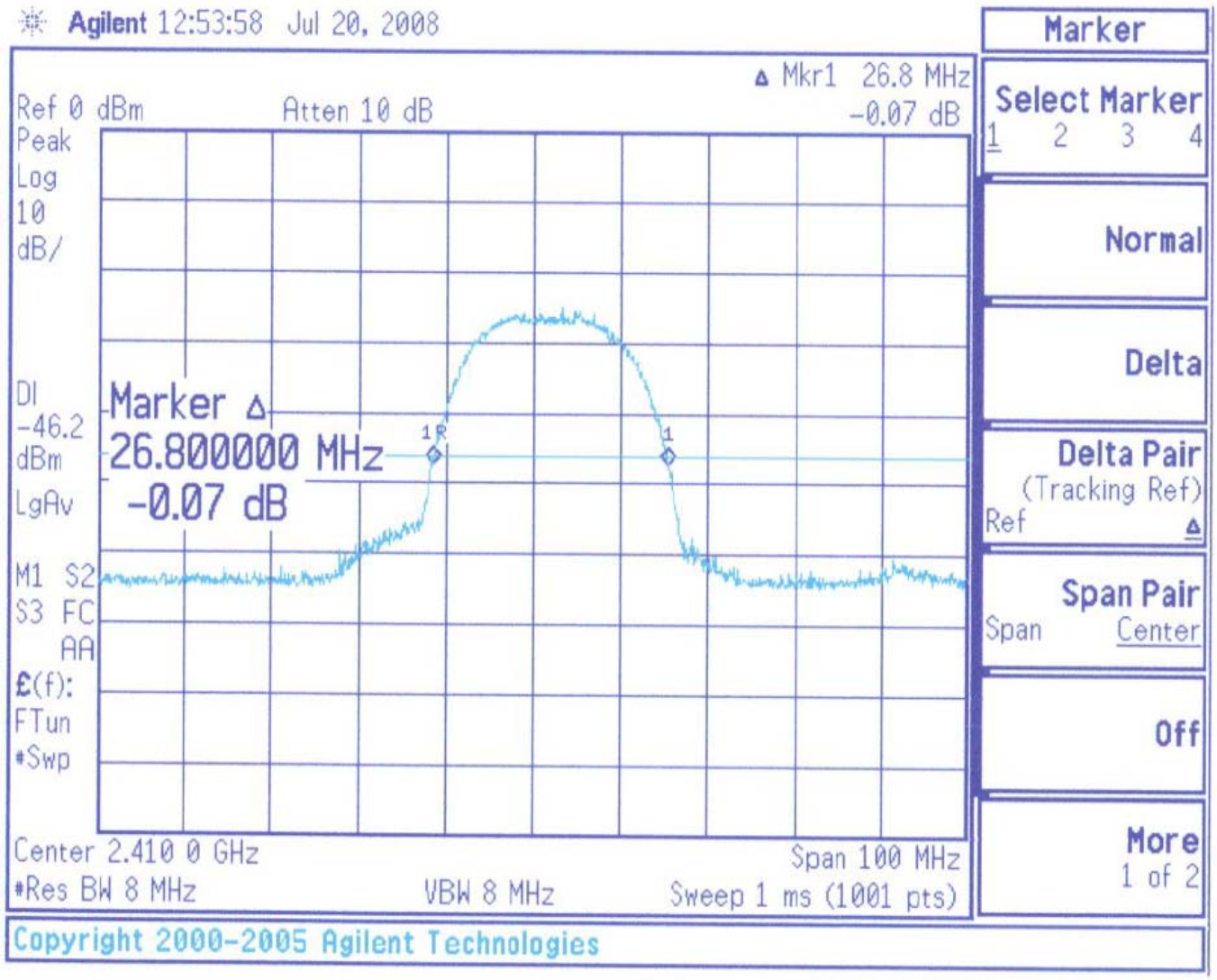
99% Occupied bandwidth
54 Mbps, 1 of 3



Amplitude to determine -20dBc level of -46.23

54Mb/s 99% BW

99% Occupied bandwidth
54 Mbps, 2 of 3

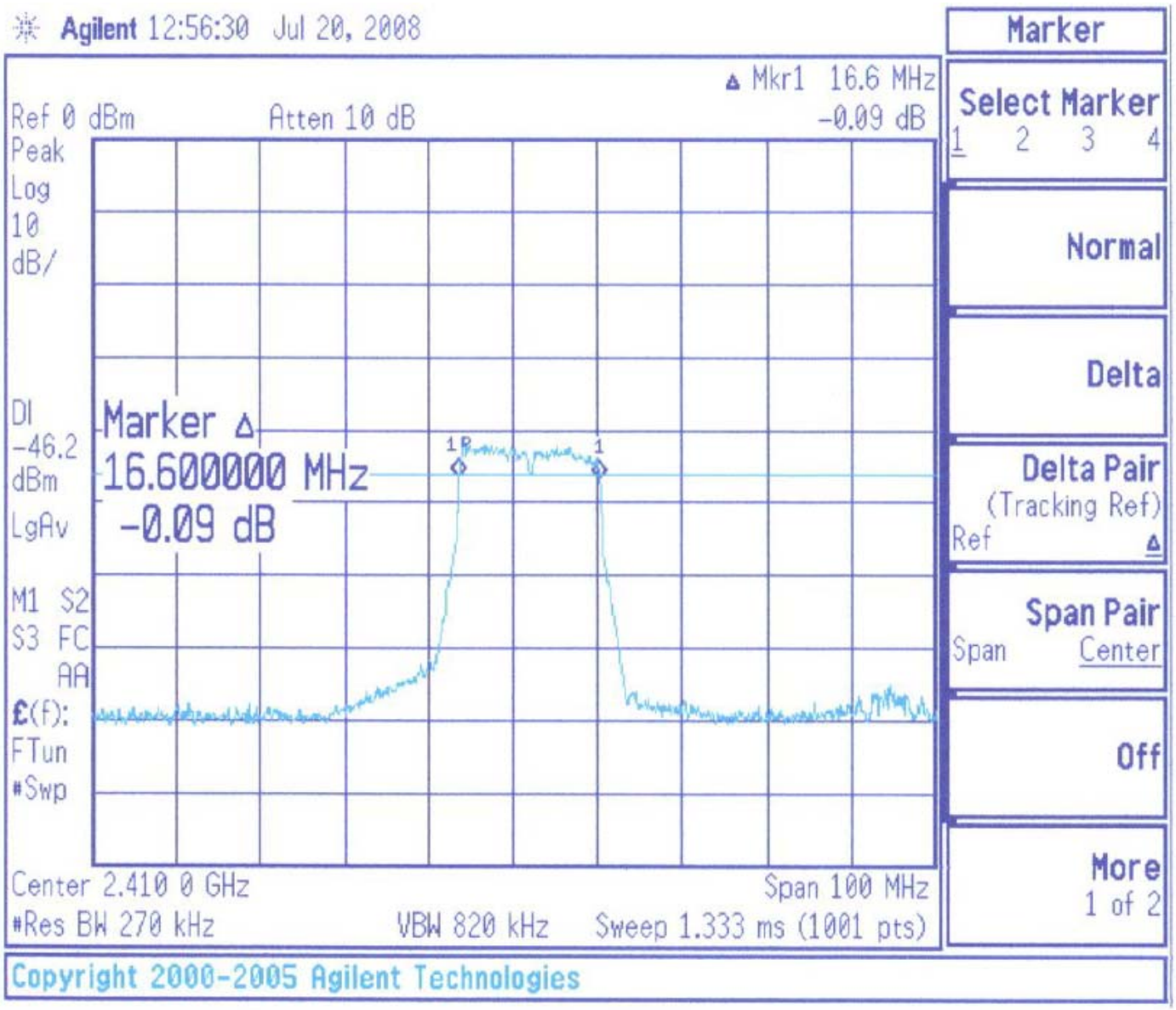


54Mb/s emission BW with 8MHz/rbw

1% of 26.8MHz = 270 KHz RBW

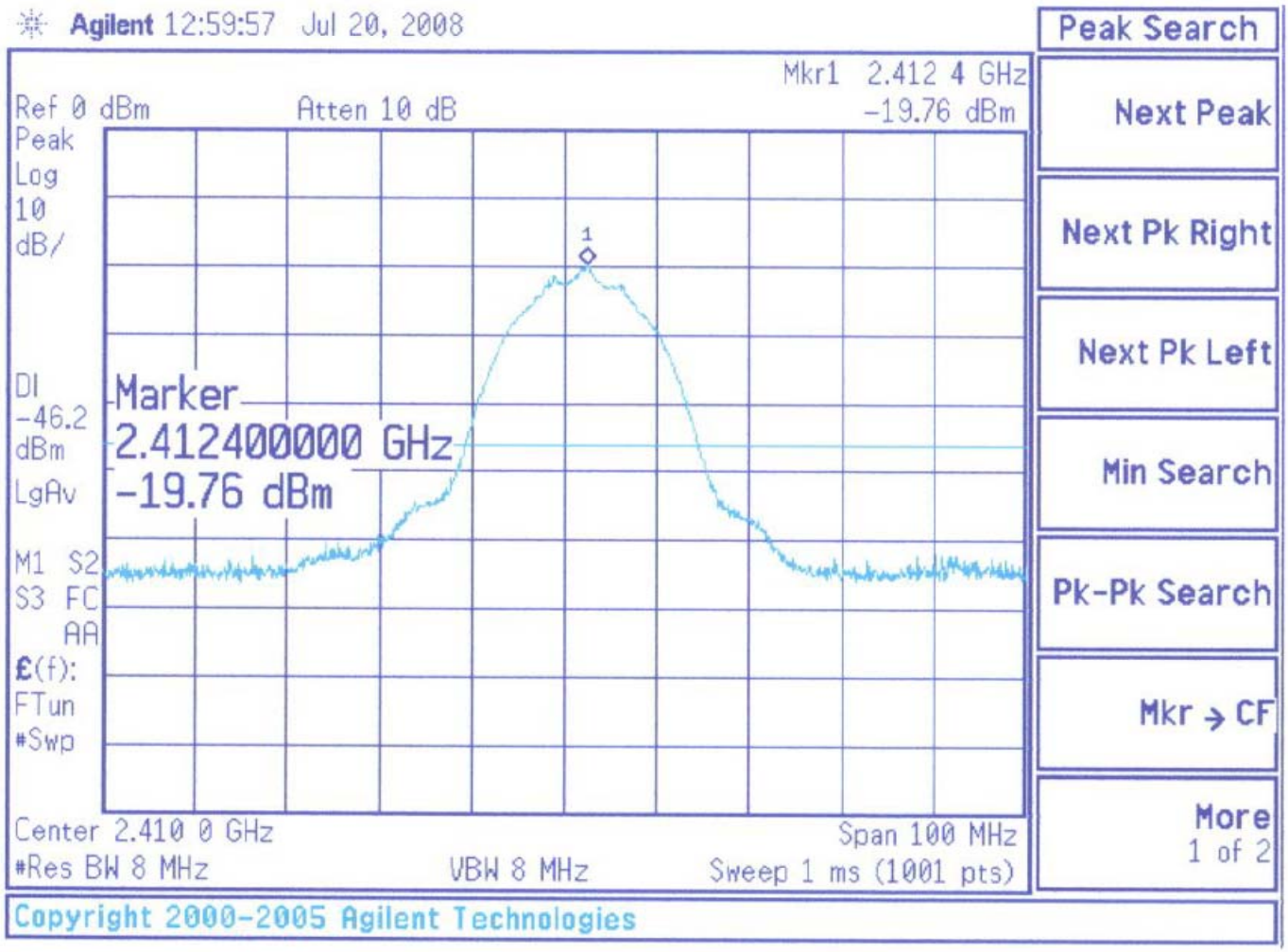
99% BW

99% Occupied bandwidth
54 Mbps, 3 of 3



54Mb/s 99% BW = 16.6MHz

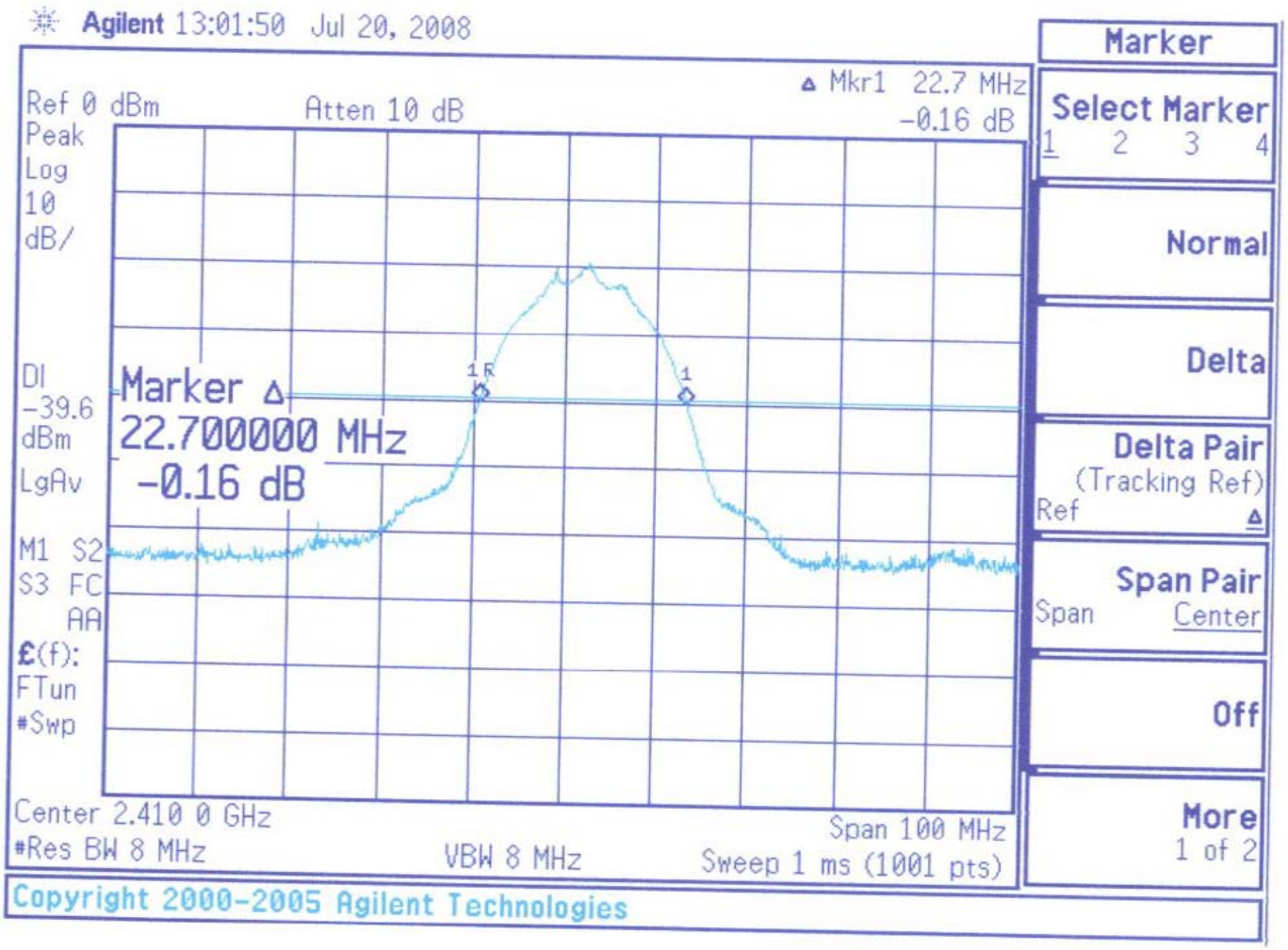
99% Occupied bandwidth
11 Mbps, 1 of 3



11Mb/s amplitude to determine -20dBc points
= -39.76

99% BW

99% Occupied bandwidth
11 Mbps, 2 of 3



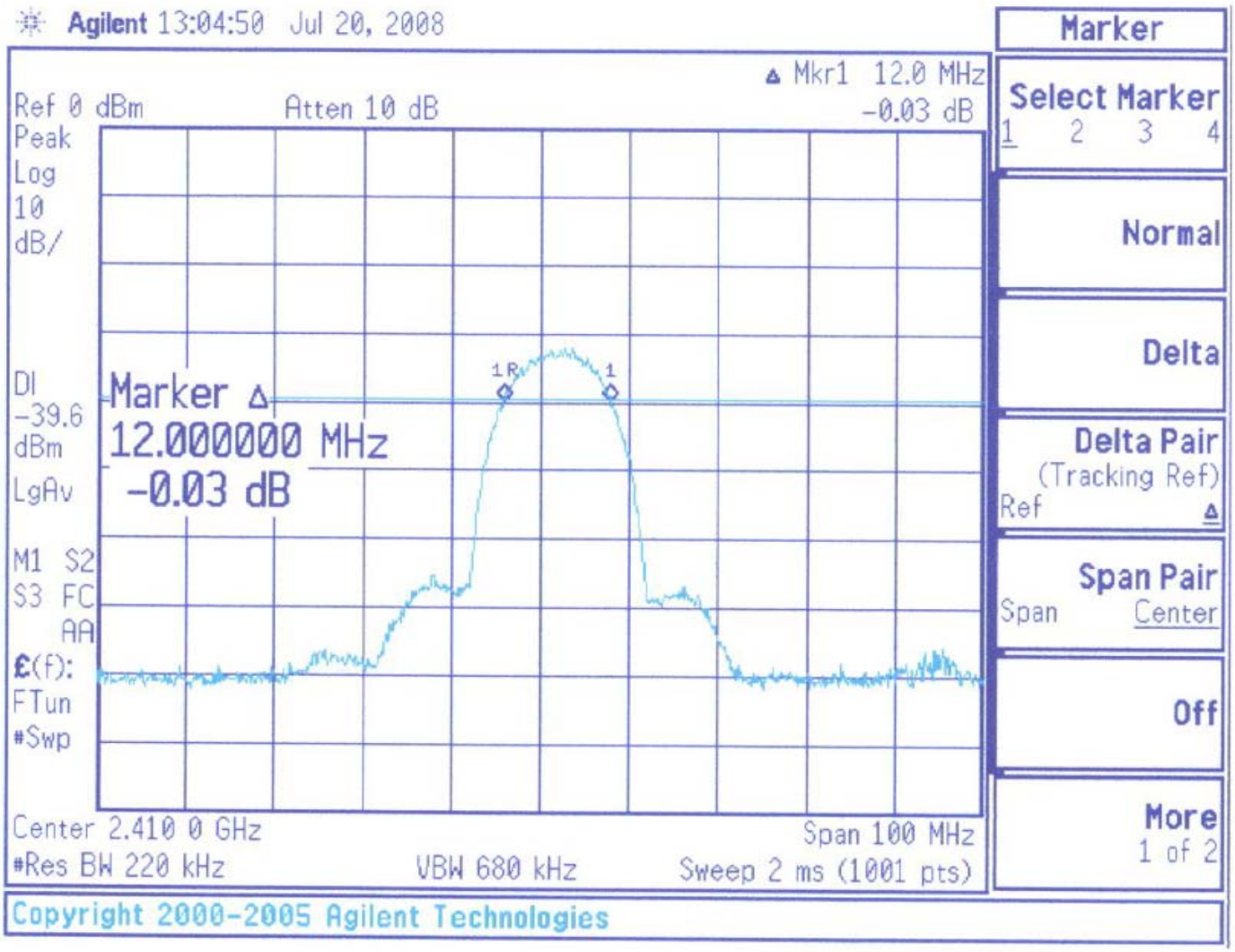
-20 dBc BW w/ 8 MHz RBW = 22.7 MHz

1% of 22.7 MHz = 220 KHz

99% BW

11 Mb/s

99% Occupied bandwidth
11 Mbps, 3 of 3

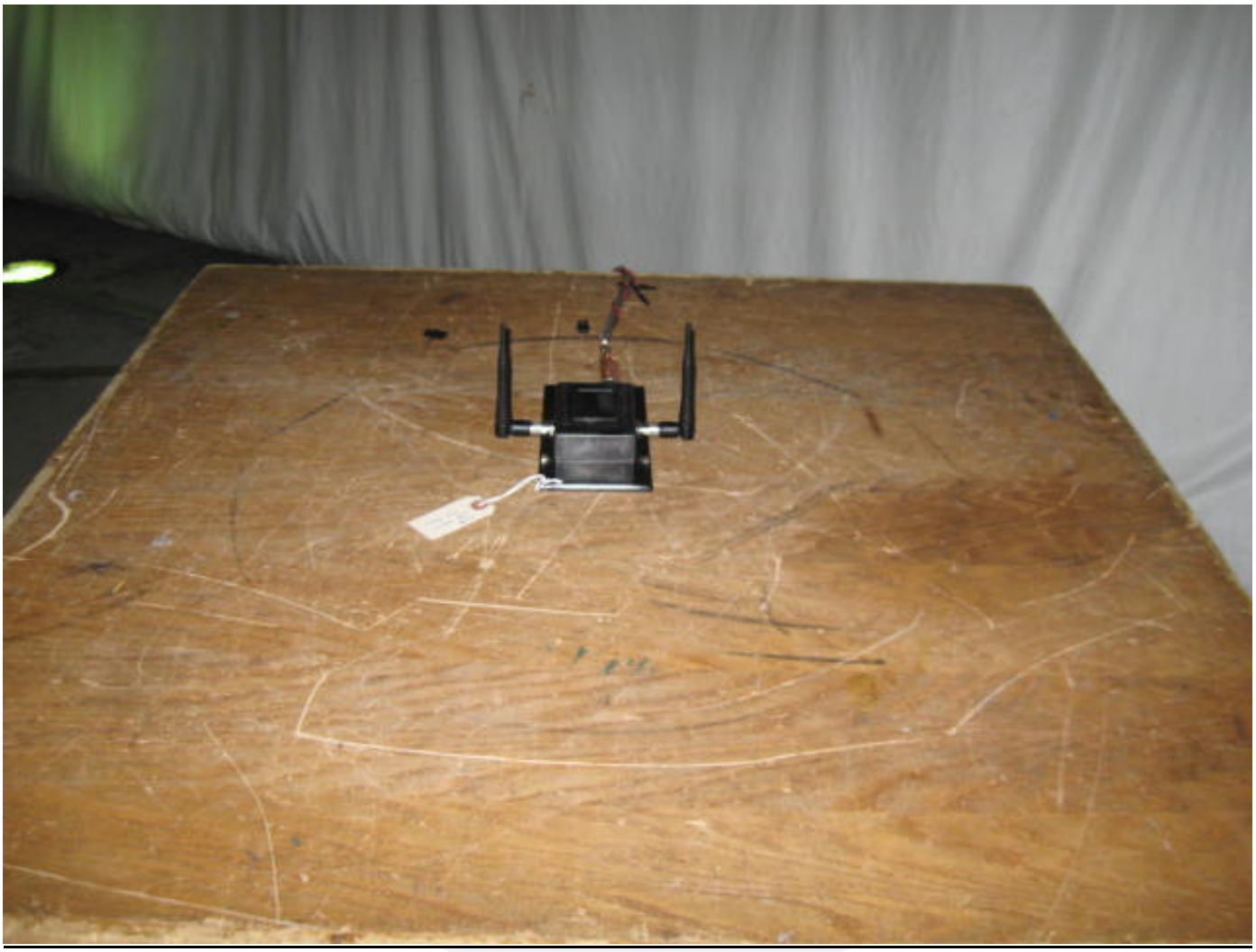


11 Mb/s 99% Bw = 12 MHz

Conducted limits – AC power lines
FCC 15.207 – RSS-GEN 7.2.2

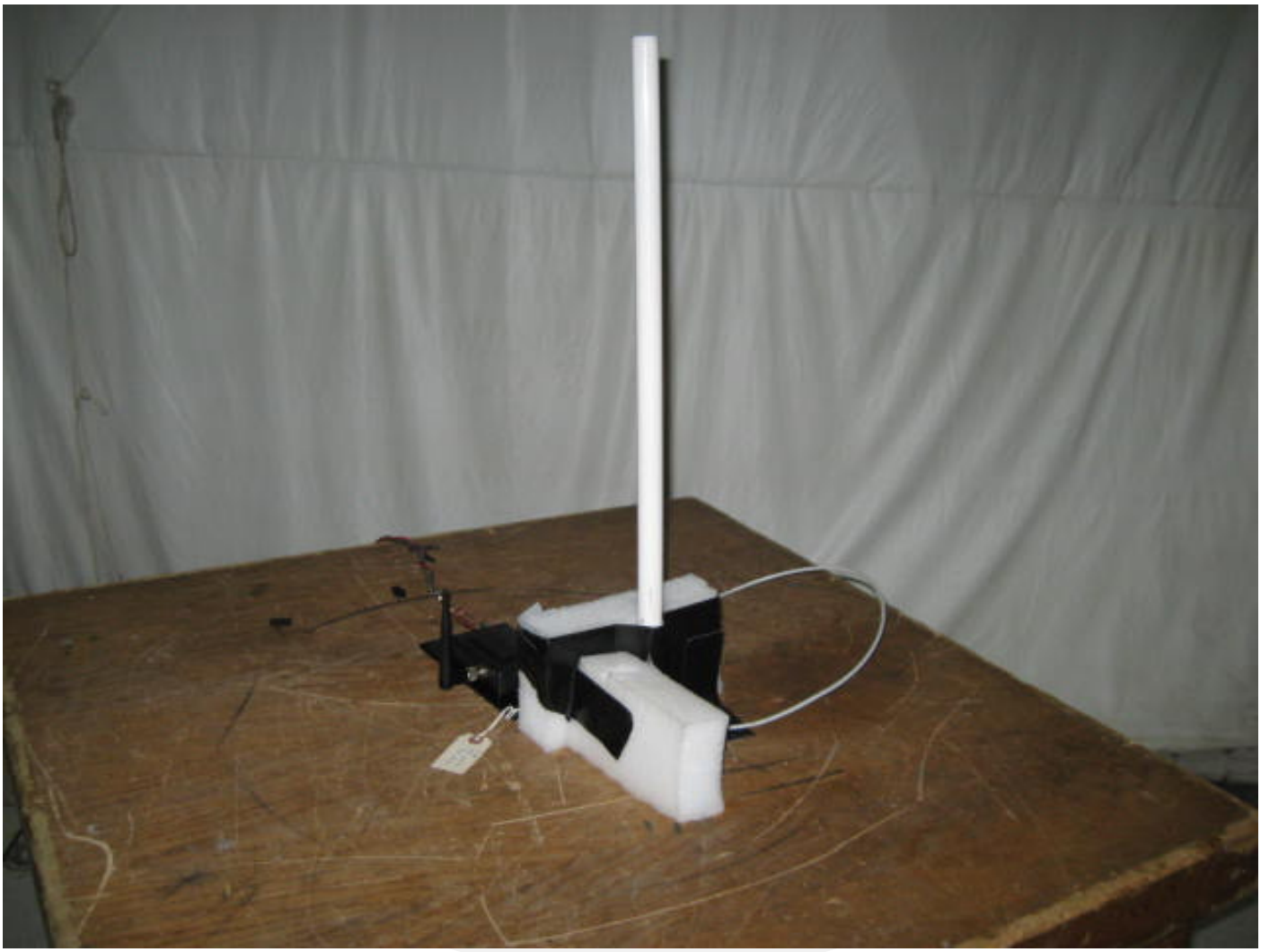
Test summary
The requirements are: ☐ - MET ☐ - NOT MET ■ - NOT APPLICABLE
The EUT will be powered by DC batteries

Test-setup photo(s):
Radiated measurements, 2 dBi antenna

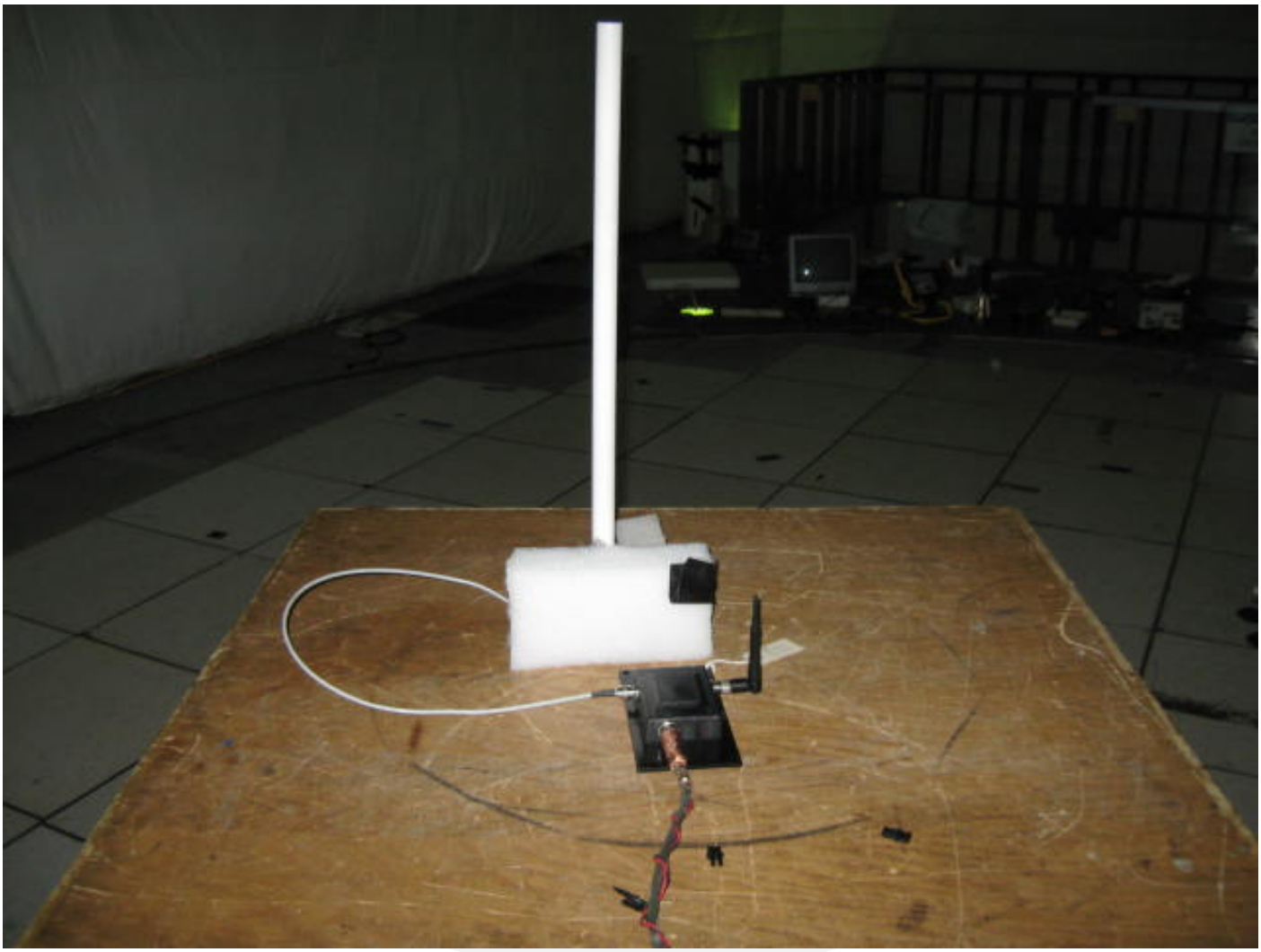


Test-setup photo(s):
Radiated measurements, 2 dBi antenna

Test-setup photo(s):
Radiated measurements, 5 dBi antenna



Test-setup photo(s):
Radiated measurements, 5 dBi antenna



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:	20 July 2008
Condition of EUT:	Normal
Testing Start Date:	20 July 2008
Testing End Date:	11 June 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		
Address:	11001 Bren Road E.		
	Minnetonka, MN 55343		
Contact:	Trinh Huynh	Position:	Engineering Services
Phone:	(515) 257-4120	Fax:	
E-mail Address:	trinh.huynh@digi.com		

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

EUT Description	USB/Ethernet 10/100 Base T/WLAN Transciever		
EUT Name	Caterpillar 802.11 a/b/g Radio		
Model No.:	50001520-01	Serial No.:	
Product Options:	-01 Ethernet -02 USB variant		
Configurations to be tested:			

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:	Addition of an external antenna option
Modifications made during test:	

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: Please see Quote SD121214186260 for reference of standards

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

EMC Test Plan and Constructional Data Form

America

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 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: 8.00" Width: 4.00" Height: 1.50" Weight: 520g

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: 12Vdc/5.0Vdc (If battery powered, make sure battery life is sufficient to complete testing.)

# of Phases: _____

Current (Amps/phase(max)): 280mA/700mA Current (Amps/phase(nominal)): 220mA

Other _____

Other Special Requirements

Typical Installation and/or Operating Environment

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

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*	☒	☐
Power/Comm	☐	☒	☒	☐	1	☒	☐	Foil		Metallized 8-pin DIN		4	☒	☐
WLAN RF	☒	☐	☒	☐	2	☒	☐	Antenna	Coaxial	RP-TNC	50 ohm	2	☒	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
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	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐
	☐	☐	☐	☐		☐	☐						☐	☐

EMC Test Plan and Constructional Data Form

EUT Software.

Revision Level: 20080619

Description: USB/Ethernet Immunity Test

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. Continous ping of active IP Address ports (Ethernet, USB, WLAN)
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 #
CAT WLAN 802.11 a/b/g			

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 #*
Micron Transport GX+	n870-00CLG-M1-750	293162-001	07JGL2411AP
Cisco Systems Aironet 1200	MP21/RM22	FTX1045E1F5	LDK102053

Oscillator Frequencies

Frequency	*Derived Frequency*	*Component # / Location*	*Description of Use*
48.000MHz		U24	USB Clock
29.4919MHz		X2	Main System Clock
25.000MHz		X1	Ethernet Clock
40.000MHz		U21	BaseBand Clock Input

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

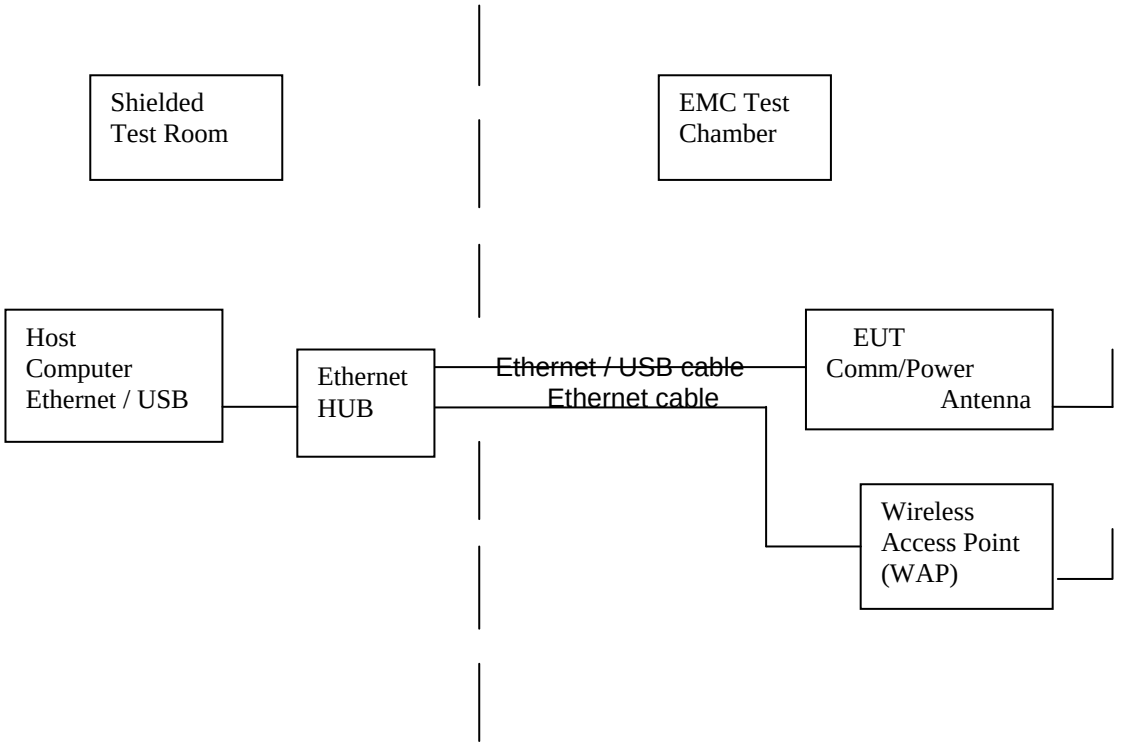
Authorization Signatures (Signature Required for Certifications checked on pg 1)

Customer authorization to perform tests according to this test plan.	Date
Test Plan/CDF Prepared By (please print)	Date

Form

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 equal to or greater than 100 Hz from 9 kHz to 150 kHz, 9 kHz from 150 kHz to 30 MHz, 100 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.