



**TEST REPORT OF A DELL WIRELESS 1450 DUAL-
BAND USB 2.0 ADAPTOR, BRAND DELL,
MODEL D1450U, IN CONFORMITY WITH
47 CFR PART 15 (DECEMBER 8, 2003).**

FCC listed : 90828
Industry Canada : IC3501
VCCI registered : R-1518, C-1598

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Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

MEASUREMENT/TECHNICAL REPORT

Gemtek Technology

Model : D1450U

FCC ID: RGS9207U

September 6, 2004

This report concerns:	Original grant/certification	Class 2 change	Verification
Equipment type:	Unlicensed U-NII Device		
Deferred grant requested per 47 CFR 0.457(d)(1)(ii) ?	Yes	No	
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The data taken for this test and report herein was done in accordance with 47 CFR Part 15 and the measurement procedures of ANSI C63.4-1992. TNO Electronic Products & Services (EPS) B.V. at Niekerk, The Netherlands, certifies that the data is accurate and contains a true representation of the emission profile of the Equipment Under Test (EUT) on the date of the test as noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: September 6, 2004

Signature:

P. de Beer
TNO Electronic Products & Services (EPS) B.V.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

Description of test item

Test item : Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer : Gemtek Technology
Brand : Dell
Model : D1450U
Serial numbers : TW-047009-36210-488-0005
Revision : A00
Receipt number : 1
Receipt date : August 23, 2004

Applicant information

Applicant's representative : Mr. D. Sariredjo
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Test(s) performed

Location : Niekerk
Test(s) started : August 23, 2004
Test(s) completed : September 3, 2004
Purpose of test(s) : Type approval / certification
Test specification(s) : 47 CFR Part 15 (December 8, 2003)

Test engineer : O.H. Hoekstra

H.J. Pieters

Report written by : P.A.J.M. Robben, B.Sc.E.E.

Project leader : H.J. Pieters

This report is in conformity with NEN-EN-ISO/IEC 17025: 2000.

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The test results relate only to the item(s) tested.



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Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

1 General information.

1.1 Product description.

The Dell Wireless 1450 dual-band USB 2.0 adaptor, brand Dell, model D1450U, is designed to operate in the 5 GHz unlicensed U-NII devices frequency band (5.25 GHz – 5.35 GHz), as specified by the Federal Communications Commission in the USA.

The Dell Wireless 1450 dual-band USB 2.0 adaptor, brand Dell, model D1450U, utilizes Direct Sequence Spread Spectrum (DSSS) and OFDM modulation techniques.

The Dell Wireless 1450 dual-band USB 2.0 adaptor, brand Dell, model D1450U, incorporates an integral antenna.

1.2 Related submittal(s) and/or Grant(s).

Not applicable.

1.3 Tested system details.

Details and an overview of the system and all its components, as it has been tested, can be found in table 1 below. FCC ID's are stated in this overview where applicable. The EUT is listed in the first row of this table 1.

Description	Model number	Serial number	FCC ID	Cable descriptions
Dell Wireless 1450 dual-band USB 2.0 adaptor	D1450UU	TW-047009-36210-488-0005	RGS9207U	-Shielded USB cable to notebook computer (host system)
Dell notebook computer (host system)	D505	CN-0H2049-48643-450-2699	n.a. (DoC)	-Unshielded DC power cord to AC/DC adapter -Shielded parallel cable to printer -Shielded USB cable to mouse -Shielded USB cable to EUT
Dell AC/DC power adapter 100-240 VAC/1.5 Amps to +19.5 VDC/3.34 Amps	PA-12 family, AA22850	CN-0T2357-16291-44U-04D6	n.a. (DoC)	-Unshielded DC power cord to notebook computer (host system) -Unshielded power cord to AC mains
Hewlett-Packard Wheel Mouse	X05-41663	n.a.	n.a. (DoC)	-Shielded USB cable to notebook computer (host system)
HP DeskJet 895Cxi	C6410A	ES8B42307H	n.a. (DoC)	-Unshielded DC power cord to AC/DC adapter -Shielded parallel cable to notebook computer (host system)
HP AC/DC power adapter 100-240 VAC/1 Amps to +18 VDC/1.1 Amps	C6409-60014	n.a.	n.a. (DoC)	-Unshielded DC power cord to printer -Unshielded power cord to AC mains

Table 1 - Tested system details overview.



Test specification(s):	47 CFR Part 15 (December 8, 2003)
Description of EUT:	Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer:	Gemtek Technology
Brand mark:	Dell
Model:	D1450U
FCC ID:	RGS9207U

1.4 Test methodology.

The test methodology used is based on the requirements of 47 CFR Part 15 (December 8, 2003), sections 15.107, 15.207, 15.109, 15.209, 15.205 and Subpart E (Unlicensed National Information Infrastructure Devices).

The test methods, which have been used, are based on ANSI C63.4: 1992.

Radiated emission tests above 30 MHz were performed at a measurement distance of 3 meters. Below 30 MHz the radiated emission tests were carried out at measurement distances of 3 and 10 meters. The test results regarding the radiated emission tests on frequencies below 30 MHz have been extrapolated in order to determine the field strength of the measured values at measurement distances of 30 and 300 meters (as required by 47 CFR Part 15).

The bandwidth of the receiver is switching automatically to the right bandwidth in accordance with CISPR 16. This is implemented in the receiver. The antenna factors are programmed in the test receiver. The receiver automatically calculates the appropriate correction factor for the utilized antenna and also the appropriate antenna factor for the cable loss. The total correction is automatically added to the measured value.

Radiated emission tests in the frequency range of 1 GHz – 40 GHz were performed with appropriate pre-amplifiers, antennas and a spectrum analyzer. At frequencies on which radiated emissions were found the level at the input of the pre-amplifier was reproduced by means of a RF signal generator. The output level of the signal generator was then increased with the antenna factor in order to obtain the actual field strength value for each individual frequency on which radiated emissions were found.

1.5 Test facility.

The Federal Communications Commission has reviewed the technical characteristics of the test facilities at TNO Electronic Products & Services (EPS) B.V., located in Niekerk, 9822 TL Smidshornerweg 18, The Netherlands, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948, per October 23, 2000.

The description of the test facilities has been filed at the Office of the Federal Communications Commission under registration number 90828. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The list of all public test facilities is available on the Internet at <http://www.fcc.gov>.

1.6 Product labeling.

In accordance with 47 CFR Part 15.19 (a)(3) the following text shall be placed on a label, which is attached to the EUT:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

In accordance with 47 CFR Part 2.925 (a)(1), the FCC ID shall be placed on a label, which is attached to the EUT.

For further details about the labeling requirements (size, legibility, etc.) as set by the Federal Communications Commission see 47 CFR Part 15.19 (a)(3), 47 CFR Part 15.19 (b)(2), 47 CFR Part 15.19 (b)(4), 47 CFR Part 2.925 and 47 CFR Part 2.926.



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1.7 System test configuration.

1.7.1 Justification.

The EUT was connected to the USB expansion connector of the host system. The EUT was tested while using its integral antenna.

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.4: 1992.

Tests were performed at the operating frequencies channel 52 (5260 MHz) and channel 64 (5320 MHz). Further details may be found in table 2 below.

Channel	Operating frequencies (MHz)	Maximum rated output power (conducted, mW)	Test performed
52	5260	67.8	yes
56	5280	67.8	no
60	5300	67.8	no
64	5320	67.8	yes

Table 2 - Specification of channels and rated maximum peak conducted transmit output power.

The EUT is able to transmit at various transmission bit-rates and utilizes a number of modulation techniques and modulation schemes. Table 3 lists all possible transmission bit-rates, modulation techniques and modulation schemes the EUT may utilize. The choice of the various transmission bit-rates which should be selected during all tests is based on the results of pre-scans from which the worst-case behavior of the EUT at certain transmission bit-rates could be determined.

Transmission bit-rate (Mbit/s)	Modulation technique	Modulation	Test performed
6	OFDM	BPSK	yes
9	OFDM	BPSK	yes
12	OFDM	QPSK	no
18	OFDM	QPSK	yes
24	OFDM	16 QAM	no
36	OFDM	16 QAM	yes
48	OFDM	64 QAM	no
54	OFDM	64 QAM	yes

Table 3 - Specification of transmission bit-rates, modulation techniques and modulation schemes.

1.7.2 EUT test software.

The EUT could be enabled to transmit or receive continuously on channels 52 (5260 MHz) and 64 (5320 MHz) by means of test software, which was supplied by the manufacturer of the EUT.

Furthermore, the utilized test software also enables access to transmission bit-rate settings in the range of: 6 Mbits/s, 9 Mbit/s, 12 Mbit/s, 18 Mbit/s, 24 Mbit/s, 36 Mbit/s, 48 Mbit/s and 54 Mbit/s (OFDM mode).

The test software enabled operation of the device with a duty-cycle of 100% in continuous transmit mode.



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FCC ID:	RGS9207U

1.8 Special accessories.

No special accessories are used and/or needed to achieve compliance with the appropriate sections of 47 CFR Part 15.

1.9 Equipment modifications.

No modifications have been made to the equipment in order to achieve compliance with the appropriate sections of 47 CFR Part 15.

1.10 Configuration of the tested system.

Not applicable. See table 1 in section 1.3 of this test report.

1.11 Block diagram(s) of the EUT.

The block diagram is available as part of the documentation which is to be submitted to the FCC/TCB.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

2 Radiated emission data.

2.1 Test results with EUT operating in receive mode on channel 52.

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15.109 and 47 CFR Part 15.209 with the EUT operating in receive mode on channel 52 (5260 MHz), are depicted in table 4.

Frequency (MHz)	Test results quasi peak (dB μ V/m)		Test results average (dB μ V/m)		Test results peak (dB μ V/m)		Resolution bandwidth (kHz)	Quasi peak limits (dB μ V/m)	Average limits (dB μ V/m)	Peak limits (dB μ V/m)
	V	H	V	H	V	H				
98.30	28.8	23.8	-	-	-	-	120	43.5	-	-
240.00	20.5	28.7	-	-	-	-	120	46.0	-	-
299.90	28.9	39.0	-	-	-	-	120	46.0	-	-
399.80	26.7	35.2	-	-	-	-	120	46.0	-	-
480.00	29.7	30.4	-	-	-	-	120	46.0	-	-
720.00	35.8	31.2	-	-	-	-	120	46.0	-	-
1817.00	-	-	n.t.	n.t.	40.4	39.3	1000	-	54.0	74.0
10520.00	-	-	n.t.	n.t.	43.0	41.5	1000	-	54.0	74.0
21040.00	-	-	n.t.	n.t.	37.6	32.2	1000	-	54.0	74.0

Table 4 - Test results with the EUT operating in receive mode on channel 52 (5260 MHz).

Note: Above 1 GHz, all measured values of the spurious emissions with the detector in peak mode, are below the applicable limits, which are valid when using an average detector. Therefore, all spurious emissions above 1 GHz have been measured with the peak detector only (n.t. = not tested), unless otherwise noted.

Note: Field strength values of radiated emissions at frequencies not listed in table 4 are more than 20 dB below the applicable limit.

Test engineer

Signature

Name : Onno H. Hoekstra

Date : August 23, 2004



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

2.2 Test results with EUT operating in receive mode on channel 64.

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15.109 and 47 CFR Part 15.209 with the EUT operating in receive mode on channel 64 (5320 MHz), are depicted in table 5.

Frequency (MHz)	Test results quasi peak (dBµV/m)		Test results average (dBµV/m)		Test results peak (dBµV/m)		Resolution bandwidth (kHz)	Quasi peak limits (dBµV/m)	Average limits (dBµV/m)	Peak limits (dBµV/m)
	V	H	V	H	V	H				
98.30	28.8	23.8	-	-	-	-	120	43.5	-	-
240.00	20.5	28.7	-	-	-	-	120	46.0	-	-
299.90	28.9	39.0	-	-	-	-	120	46.0	-	-
399.80	26.7	35.2	-	-	-	-	120	46.0	-	-
480.00	29.7	30.4	-	-	-	-	120	46.0	-	-
720.00	35.8	31.2	-	-	-	-	120	46.0	-	-
1817.00	-	-	n.t.	n.t.	40.6	40.1	1000	-	54.0	74.0
10640.00	-	-	n.t.	n.t.	43.6	42.1	1000	-	54.0	74.0
21280.00	-	-	n.t.	n.t.	38.9	33.0	1000	-	54.0	74.0

Table 5 - Test results with the EUT operating in receive mode on channel 64 (5320 MHz).

Note: Above 1 GHz, all measured values of the spurious emissions with the detector in peak mode, are below the applicable limits, which are valid when using an average detector. Therefore, all spurious emissions above 1 GHz have been measured with the peak detector only (n.t. = not tested), unless otherwise noted.

Note: Field strength values of radiated emissions at frequencies not listed in table 5 are more than 20 dB below the applicable limit.

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : August 23, 2004



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

2.3 Test results with EUT operating in transmit mode on channel 52.

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15.109, 47 CFR Part 15.209 and 47 CFR Part 15.205 (restricted bands of operation) with the EUT operating in transmit mode on channel 52 (5260 MHz), are depicted in table 6.

Frequency (MHz)	Test results quasi peak (dBµV/m)		Test results average (dBµV/m)		Test results peak (dBµV/m)		Resolution bandwidth (kHz)	Quasi peak limits (dBµV/m)	Average limits (dBµV/m)	Peak limits (dBµV/m)
	V	H	V	H	V	H				
98.30	29.3	23.9	-	-	-	-	120	43.5	-	-
240.00	21.4	29.2	-	-	-	-	120	46.0	-	-
299.90	30.7	40.9	-	-	-	-	120	46.0	-	-
399.80	26.1	34.3	-	-	-	-	120	46.0	-	-
480.00	29.3	29.8	-	-	-	-	120	46.0	-	-
720.00	34.9	31.8	-	-	-	-	120	46.0	-	-
10520.00	-	-	41.0	37.6	< 54.0	< 54.0	1000	-	54.0	74.0
15780.00	-	-	40.9	< 34.0	< 54.0	< 54.0	1000	-	54.0	74.0
21040.00	-	-	36.6	< 34.0	< 54.0	< 54.0	1000	-	54.0	74.0

Table 6 - Test results with the EUT operating in transmit mode on channel 52 (5260 MHz).

Note: Radiated emission tests have been performed with all possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s) in transmit mode. The highest values measured of the spurious emission components are reported by means of table 6.

Note: Field strength values of radiated emissions at frequencies not listed in table 6 are more than 20 dB below the applicable limit.

Test engineer

Signature

Name : Onno H. Hoekstra

Date : August 23, 2004



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

2.4 Test results with EUT operating in transmit mode on channel 64.

The results of the radiated emission tests, carried out in accordance with 47 CFR Part 15.109, 47 CFR Part 15.209 and 47 CFR Part 15.205 (restricted bands of operation) with the EUT operating in transmit mode on channel 64 (5320 MHz), are depicted in table 7.

Frequency (MHz)	Test results quasi peak (dBµV/m)		Test results average (dBµV/m)		Test results peak (dBµV/m)		Resolution bandwidth (kHz)	Quasi peak limits (dBµV/m)	Average limits (dBµV/m)	Peak limits (dBµV/m)
	V	H	V	H	V	H				
98.30	29.3	23.9	-	-	-	-	120	43.5	-	-
240.00	21.4	29.2	-	-	-	-	120	46.0	-	-
299.90	30.7	40.9	-	-	-	-	120	46.0	-	-
399.80	26.1	34.3	-	-	-	-	120	46.0	-	-
480.00	29.3	29.8	-	-	-	-	120	46.0	-	-
720.00	34.9	31.8	-	-	-	-	120	46.0	-	-
10640.00	-	-	42.4	36.5	< 54.0	< 54.0	1000	-	54.0	74.0
15960.00	-	-	37.7	< 34.0	< 54.0	< 54.0	1000	-	54.0	74.0
21280.00	-	-	35.8	< 34.0	< 54.0	< 54.0	1000	-	54.0	74.0

Table 7 - Test results with the EUT operating in transmit mode on channel 64 (5320 MHz).

Note: Radiated emission tests have been performed with all possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s) in transmit mode. The highest values measured of the spurious emission components are reported by means of table 7.

Note: Field strength values of radiated emissions at frequencies not listed in table 7 are more than 20 dB below the applicable limit.

Test engineer

Signature

Name : Onno H. Hoekstra

Date : August 23, 2004



Test specification(s): 47 CFR Part 15 (December 8, 2003)
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Manufacturer: Gemtek Technology
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3 Conducted emission data.

3.1 AC mains with EUT operating in transmit/receive mode.

The (worst-case) results of the conducted emission tests at the 110 Volts AC mains connection terminals of the notebook computer in which the EUT is built into, carried out in accordance with 47 CFR Part 15.107 and 47 CFR Part 15.207, with the EUT operating in transmit/receive mode on channels 52 (5260 MHz) and 64 (5320 MHz), while utilizing all possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s), are depicted in table 8.

Frequency (MHz)	Measurement results dB(μV) Neutral		Measurement results dB(μV) Line 1		Limits dB(μV)		Margin (dB) Neutral		Margin (dB) Line 1		Result
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV	
0.15	37.4	19.5	37.7	20.2	66.0	56.0	-28.6	-36.5	-28.3	-35.8	PASS
0.21	47.6	40.2	50.3	43.9	63.2	53.2	-15.6	-13.0	-12.9	-9.3	PASS
0.42	32.4	28.9	36.5	33.8	57.4	47.4	-25.0	-18.5	-20.9	-13.6	PASS
0.74	24.4	19.5	33.4	31.7	56.0	46.0	-31.6	-26.5	-22.6	-14.3	PASS
1.80	23.6	15.2	24.2	16.2	56.0	46.0	-32.4	-30.8	-31.8	-29.8	PASS
3.00	12.8	6.9	15.1	9.9	56.0	46.0	-43.2	-39.1	-40.9	-36.1	PASS
4.19	18.4	13.0	31.8	27.9	56.0	46.0	-37.6	-33.0	-24.2	-18.1	PASS
7.44	29.2	19.7	34.4	26.1	60.0	50.0	-30.8	-30.3	-25.6	-23.9	PASS
10.27	35.7	26.5	33.0	22.7	60.0	50.0	-24.3	-23.5	-27.0	-27.3	PASS
14.15	31.1	24.4	26.8	22.1	60.0	50.0	-28.9	-25.6	-33.2	-27.9	PASS
17.50	29.5	23.6	29.8	22.6	60.0	50.0	-30.5	-26.4	-30.2	-27.4	PASS
23.50	17.0	11.2	18.4	13.1	60.0	50.0	-43.0	-38.8	-41.6	-36.9	PASS
29.99	18.9	13.2	17.6	12.2	60.0	50.0	-41.1	-36.8	-42.4	-37.8	PASS

Table 8 - Test results with the EUT operating in transmit/receive mode.

Note: Disturbance voltage values of conducted emissions at frequencies not listed in table 8 are more than 20 dB below the applicable limit.

Test engineer

Signature : 

Name : H.J. Pieters

Date : September 3, 2004



4 Results of tests in conformity with 47 CFR Part 15, Subpart E.

4.1 Power limits.

The results of tests on the EUT, carried out in accordance with 47 CFR Part 15.407 (a)(2) in order to determine the –26 dB emission bandwidth of the transmitter signal, are depicted in table 9.

The procedure, which was used for measuring the –26 dB emission bandwidth of the transmitter signal, is defined in FCC Public Notice DA 02-2138 (August 30, 2002), Appendix A, emission bandwidth “B” MHz.

The plots of the results of the –26 dB emission bandwidth measurements may be found in section 5.1 of this test report.

Transmission bit-rate (Mbit/s)	-26 dBm emission bandwidth (kHz)	
	Ch. 52 (5260 MHz)	Ch. 64 (5320 MHz)
6	31650	28500
9	31650	24600
18	29400	23400
36	21900	19950
54	19500	19350

Table 9 - The results of the –26 dB emission bandwidth measurements.

From table 9 above it can be derived that the minimum –26 dB emission bandwidth is 19.35 MHz.

The peak transmit power limit, based on the –26 dB emission bandwidth, in the frequency band of 5.25 – 5.35 GHz can be calculated as follows:

11 dBm + 10 log B, where B is the –26 dB emission bandwidth in MHz;

11 dBm + 10 log 19.35 = 11 dBm + 12.9 = 23.9 dBm (245.5 mW).

In accordance with 47 CFR Part 15.407 (a)(2) the peak transmit power in the frequency band of 5.25 – 5.35 GHz shall not exceed the lesser of 250 mW or 11 dBm + 10log B, where B is the –26 dB emission bandwidth in MHz. It has been determined that the peak transmit power limit, based on the –26 dB emission bandwidth, in the frequency band of 5.25 – 5.35 GHz is 23.9 dBm (245.5 mW).

In accordance with 47 CFR Part 15.407 (a)(2) the peak transmit power limit, in the frequency band of 5.25 – 5.35 GHz, has been set to 23.9 dBm (245.5 mW).

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : August 31, 2004



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

4.2 Maximum peak conducted transmit output power.

The results of tests on the EUT, carried out in accordance with 47 CFR Part 15.407 (a)(4), are depicted in table 10. The maximum peak conducted transmit output power was measured directly at the (temporary) antenna connector.

The limits have been derived from 47 CFR Part 15.407 (a)(2), see also section 4.1 of this test report.

The procedure, which was used for measuring the maximum peak conducted transmit output power of the transmitter, is defined in FCC Public Notice DA 02-2138 (August 30, 2002), Appendix A, peak conducted transmit output power, test method #3.

The plots of the results of the maximum peak conducted transmit output power measurements may be found in section 5.2 of this test report.

Transmission bit-rate (Mbit/s)	Maximum peak conducted transmit output power (mW)		Antenna gain < 6 dBi Limit (conducted, mW)
	Ch. 52 (5260 MHz)	Ch. 64 (5320 MHz)	
6	66.7	49.3	245.5
9	67.8	52.6	245.5
18	64.2	50.1	245.5
36	47.0	33.1	245.5
54	27.0	16.9	245.5

Table 10 - Maximum peak conducted transmit output power.

Note: During the measurements, the AC mains supply voltage of the notebook PC in which the EUT was built-in was varied between 85% and 115% of the nominal value. The maximum measured values are depicted in table 10. No differences in measurement results, due to the AC mains voltage variations between 85% and 115% from the nominal value, have been observed. As the antenna gain does not exceed 6 dBi, no reduction of the maximum peak transmit output power is required.

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : August 31, 2004



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

4.3 Peak power spectral density.

The results of the tests on the EUT, carried out in accordance with 47 CFR Part 15.407 (a)(5), are depicted in table 11. The peak power spectral density was measured directly at the (temporary) antenna connector. The limits have been derived from 47 CFR Part 15.407 (a)(2).

It has been determined that the -26 dB emission bandwidth of the EUT is 18.8 – 35.7 MHz (depending on the transmission bit-rate and operating frequency). Therefore, in accordance with 47 CFR Part 15.407 (a)(5), the measurements have been carried out over a bandwidth of 1 MHz.

The procedure, which was used for measuring the peak power spectral density, is defined in FCC Public Notice DA 02-2138 (August 30, 2002), Appendix A, peak power spectral density, test method #2.

The plots of the results of the peak power spectral density measurements may be found in section 5.3 of this test report.

Transmission bit-rate (Mbit/s)	Peak power spectral density in any 1 MHz band (conducted, dBm)		Limit (conducted, dBm)
	Ch. 52 (5260 MHz)	Ch. 64 (5320 MHz)	
6	4.2	2.9	11.0
9	4.2	3.3	11.0
18	4.0	3.0	11.0
36	2.6	1.1	11.0
54	0.4	-1.6	11.0

Table 11 - Peak power spectral density (conducted).

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : August 31, 2004



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

4.4 Ratio of the peak excursion of the modulation envelope.

The results of the tests on the EUT, carried out in accordance with 47 CFR Part 15.407 (a)(6), are depicted in table 12.

The procedure, which was used for measuring the peak excursion of the modulation envelope, is defined in FCC Public Notice DA 02-2138 (August 30, 2002), Appendix A, peak excursion measurement. The second trace (trace “B”) was created while using the settings as described in test method #3 for the peak conducted transmit output power test procedure (see section 4.2 of this test report).

The plots of the results of the peak excursion of the modulation envelope measurements may be found in section 5.4 of this test report. The upper trace is the result of the subtraction of trace “B” from trace “A” with the 0 dBm line as the reference point.

Transmission bit-rate (Mbit/s)	Ratio of the peak excursion of the modulation envelope (dB)		Limit (dB)
	Ch. 52 (5260 MHz)	Ch. 64 (5320 MHz)	
6	9.2	9.9	< 13.0
9	10.1	9.8	< 13.0
18	9.6	10.3	< 13.0
36	11.4	10.8	< 13.0
54	11.1	10.3	< 13.0

Table 12 - Ratio of the peak excursion of the modulation envelope.

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : August 31, 2004



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

4.5 Peak emissions outside the frequency bands of operation.

4.5.1 Transmitters operating in the 5.25 – 5.35 GHz frequency band.

In accordance with 47 CFR Part 15.407 (b)(2) all emissions outside of the 5.25 – 5.35 GHz frequency band shall not exceed an EIRP of –27 dBm/MHz. The results of these measurements may be found in section 2 of this test report.

4.5.2 Unwanted emissions below 1 GHz.

In accordance with 47 CFR Part 15.407 (b)(6) all unwanted emissions below 1 GHz must comply with the general field strength limits set forth in 47 CFR Part 15.209. The results of these measurements may be found in section 2 of this test report.

Any U-NII device using an AC power line is required to comply with the conducted limits set forth in 47 CFR Part 15.207. The results of these measurements may be found in section 3 of this test report.

4.5.3 Restricted bands of operation.

In accordance with 47 CFR Part 15.407 (b)(7), intentional radiators need to comply with the provisions of 47 CFR Part 15.205. The results of these measurements may be found in section 2 of this test report.

4.5.3.1 Emission in restricted bands nearest to the band 5.25 – 5.35 GHz.

The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15.205 (restricted bands of operation), with the emphasis on the emission in restricted bands nearest to the band 5.25 – 5.35 GHz (5.35 – 5.46 GHz) and with the EUT operating in transmit mode, are depicted in table 13.

The plots of the measurement results may be found in section 5.5 of this test report.

Frequency (MHz)	Test results quasi peak (dBμV/m)	Test results average (dBμV/m)	Test results peak (dBμV/m)	Resolution bandwidth (kHz)	Quasi peak limits (dBμV/m)	Average limits (dBμV/m)	Peak limits (dBμV/m)
5350.00	-	46.5	63.5	1000	-	54.0	74.0
5356.05	-	47.2	63.1	1000	-	54.0	74.0

Table 13 - Test results with the EUT operating in transmit mode.

Note: Conducted emission tests have been performed with all possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s) in transmit mode. The highest values measured of the spurious emission components are reported by means of table 13.

Note: Field strength values of conducted emissions at frequencies not listed in table 13 are more than 20 dB below the applicable limit.

Test engineer

Signature

Name : Onno H. Hoekstra

Date : August 31, 2004



4.6 Automatic discontinuation of transmissions.

The EUT shall automatically discontinue transmission in case of either absence of information to transmit or operational failure.

In accordance with 47 CFR Part 15.407 (c) applicants shall include in their application of how this requirement is met.

4.7 Radio frequency radiation exposure.

In accordance with 47 CFR Part 15.407 (f) U-NII devices are subject to the radio frequency radiation exposure requirements specified in 47 CFR Part 1.1307 (b), 47 CFR Part 2.1091 and 47 CFR Part 2.1093, as appropriate. All equipment shall be considered to operate in a “general population/uncontrolled” environment.

In accordance with 47 CFR Part 15.407 (f) applicants shall include in their application of how this requirement is met.

4.8 Frequency stability.

In accordance with 47 CFR Part 15.407 (g) the frequency stability of U-NII devices must be such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

4.8.1 Emission in restricted bands nearest to the band 5.25 – 5.35 GHz (extreme test conditions).

The results of the conducted emission tests, carried out in accordance with 47 CFR Part 15.205 (restricted bands of operation), with the emphasis on the emission in restricted bands nearest to the band 5.25 – 5.35 GHz (5.35 – 5.46 GHz) and with the EUT operating in transmit mode, are depicted in tables 14 – 17.

The plots of the measurement results may be found in section 5.6 of this test report.

4.8.1.1 Test results at an ambient temperature of -20 °C.

Frequency (MHz)	Test results quasi peak (dBμV/m)	Test results average (dBμV/m)	Test results peak (dBμV/m)	Resolution bandwidth (kHz)	Quasi peak limits (dBμV/m)	Average limits (dBμV/m)	Peak limits (dBμV/m)
5350.00	-	47.7	59.8	1000	-	54.0	74.0
5351.60	-	47.6	60.8	1000	-	54.0	74.0

Table 14 - Test results with the EUT operating in transmit mode.

Note: Conducted emission tests have been performed with all possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s) in transmit mode. The highest values measured of the spurious emission components are reported by means of table 14. No differences in measurement results, due to the AC mains voltage variations between 85% and 115% from the nominal value, have been observed.

Note: Field strength values of conducted emissions at frequencies not listed in table 14 are more than 20 dB below the applicable limit.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

4.8.1.2 Test results at an ambient temperature of 0 °C.

Frequency (MHz)	Test results quasi peak (dBµV/m)	Test results average (dBµV/m)	Test results peak (dBµV/m)	Resolution bandwidth (kHz)	Quasi peak limits (dBµV/m)	Average limits (dBµV/m)	Peak limits (dBµV/m)
5350.00	-	46.6	59.1	1000	-	54.0	74.0
5352.80	-	46.9	60.0	1000	-	54.0	74.0

Table 15 - Test results with the EUT operating in transmit mode.

Note: Conducted emission tests have been performed with all possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s) in transmit mode. The highest values measured of the spurious emission components are reported by means of table 15. No differences in measurement results, due to the AC mains voltage variations between 85% and 115% from the nominal value, have been observed.

Note: Field strength values of conducted emissions at frequencies not listed in table 15 are more than 20 dB below the applicable limit.

4.8.1.3 Test results at an ambient temperature of +35 °C.

Frequency (MHz)	Test results quasi peak (dBµV/m)	Test results average (dBµV/m)	Test results peak (dBµV/m)	Resolution bandwidth (kHz)	Quasi peak limits (dBµV/m)	Average limits (dBµV/m)	Peak limits (dBµV/m)
5350.00	-	44.5	56.9	1000	-	54.0	74.0
5352.40	-	44.4	58.7	1000	-	54.0	74.0

Table 16 - Test results with the EUT operating in transmit mode.

Note: Conducted emission tests have been performed with all possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s) in transmit mode. The highest values measured of the spurious emission components are reported by means of table 16. No differences in measurement results, due to the AC mains voltage variations between 85% and 115% from the nominal value, have been observed.

Note: Field strength values of conducted emissions at frequencies not listed in table 16 are more than 20 dB below the applicable limit.

4.8.1.4 Test results at an ambient temperature of +50 °C.

Frequency (MHz)	Test results quasi peak (dBµV/m)	Test results average (dBµV/m)	Test results peak (dBµV/m)	Resolution bandwidth (kHz)	Quasi peak limits (dBµV/m)	Average limits (dBµV/m)	Peak limits (dBµV/m)
5350.00	-	43.7	56.2	1000	-	54.0	74.0
5359.60	-	43.6	57.3	1000	-	54.0	74.0

Table 17 - Test results with the EUT operating in transmit mode.

Note: Conducted emission tests have been performed with all possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s) in transmit mode. The highest values measured of the spurious emission components are reported by means of table 17. No differences in measurement results, due to the AC mains voltage variations between 85% and 115% from the nominal value, have been observed.

Note: Field strength values of conducted emissions at frequencies not listed in table 17 are more than 20 dB below the applicable limit.

Test engineer

Signature

Name : Onno H. Hoekstra

Date : September 6, 2004



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

4.9 Transmit power control (TPC).

In accordance with 47 CFR Part 15.407 (h)(1), U-NII devices operating in the 5.25 – 5.35 GHz and the 5.47 – 5.725 GHz frequency bands shall employ a TPC mechanism. The U-NII device is required to have the capability to operate at least 6 dB below the mean EIRP value of 30 dBm. A TPC mechanism is not required for U-NII devices having an EIRP of less than 500 mW.

The manufacturer has declared that the EUT does not make use of the 5.47 – 5.725 GHz frequency band. Therefore this requirement is not applicable to the EUT.

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : September 6, 2004

4.10 Dynamic frequency selection (DFS).

In accordance with 47 CFR Part 15.407 (h)(2), U-NII devices operating in the 5.25 – 5.35 GHz and the 5.47 – 5.725 GHz frequency bands shall employ a DFS radar detection mechanism to detect the presence of radar systems and to avoid co-channel operation with radar systems.

The manufacturer has declared that the EUT does not make use of the 5.47 – 5.725 GHz frequency band. Therefore this requirement is not applicable to the EUT.

Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : September 6, 2004



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

5 Plots of measurement data.

For reference purposes and visualization of spectrum analyzer settings during the measurements, a selection of plots of measurement data is included in this test report.

Test engineer

Signature

: 

Name

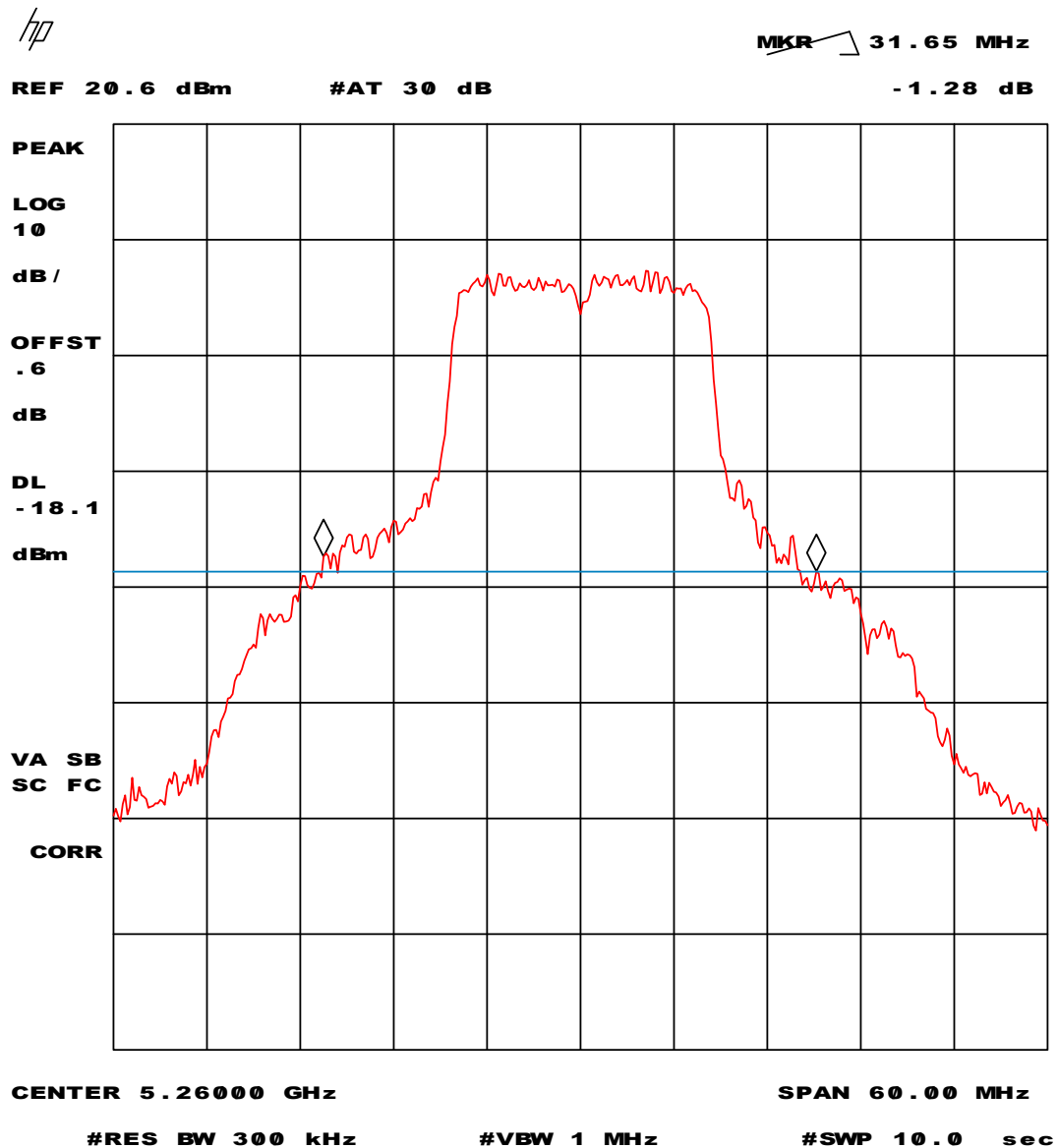
: Onno H. Hoekstra

Date

: September 6, 2003

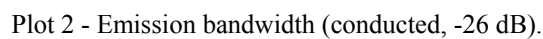
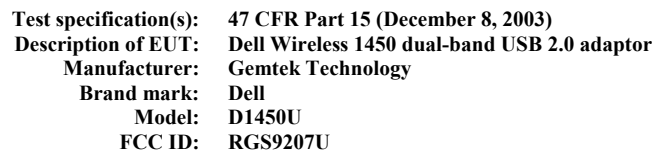


5.1 Emission bandwidth “B” MHz.

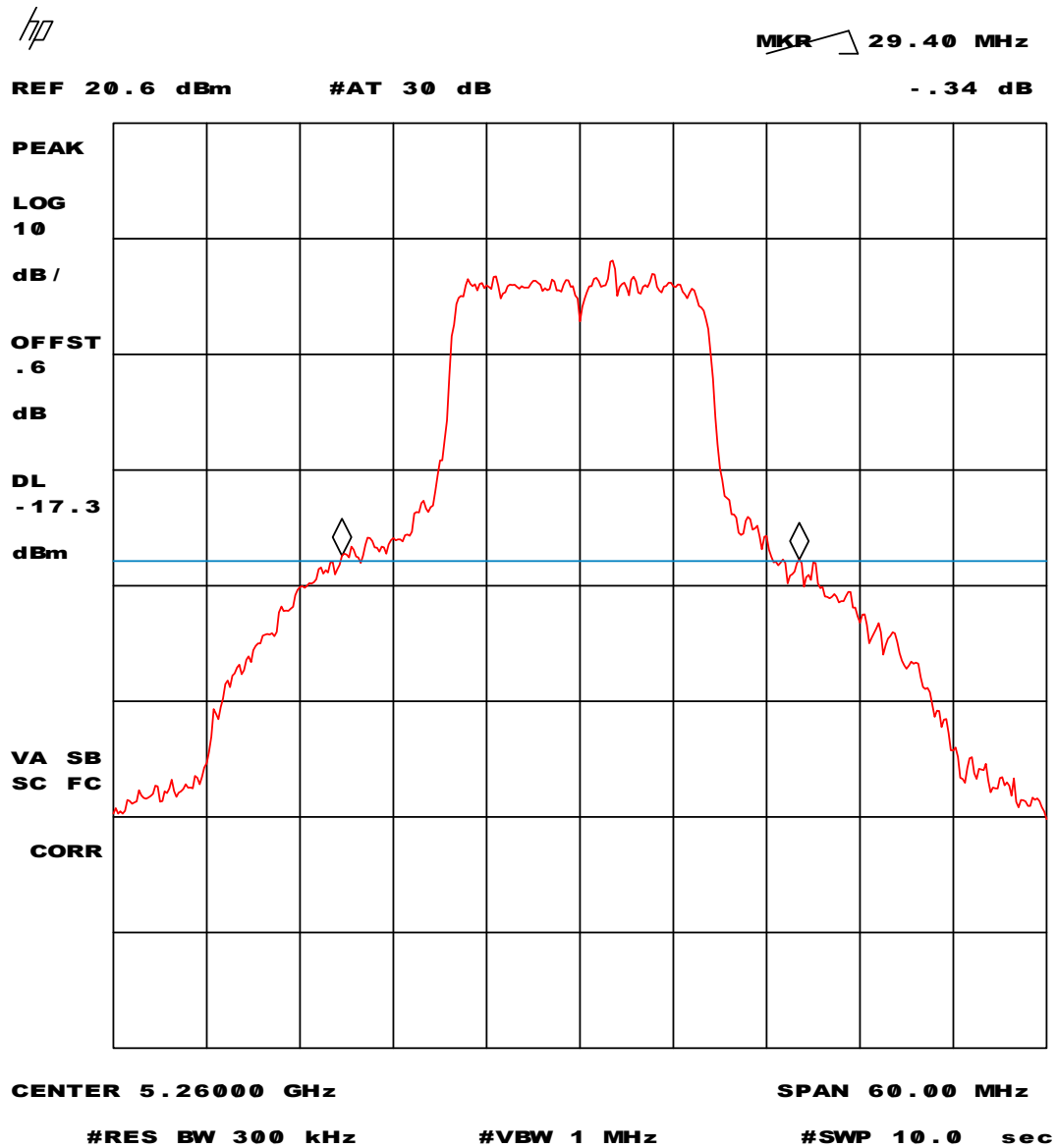


Plot 1 - Emission bandwidth (conducted, -26 dB).

Plot 1 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 6 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.

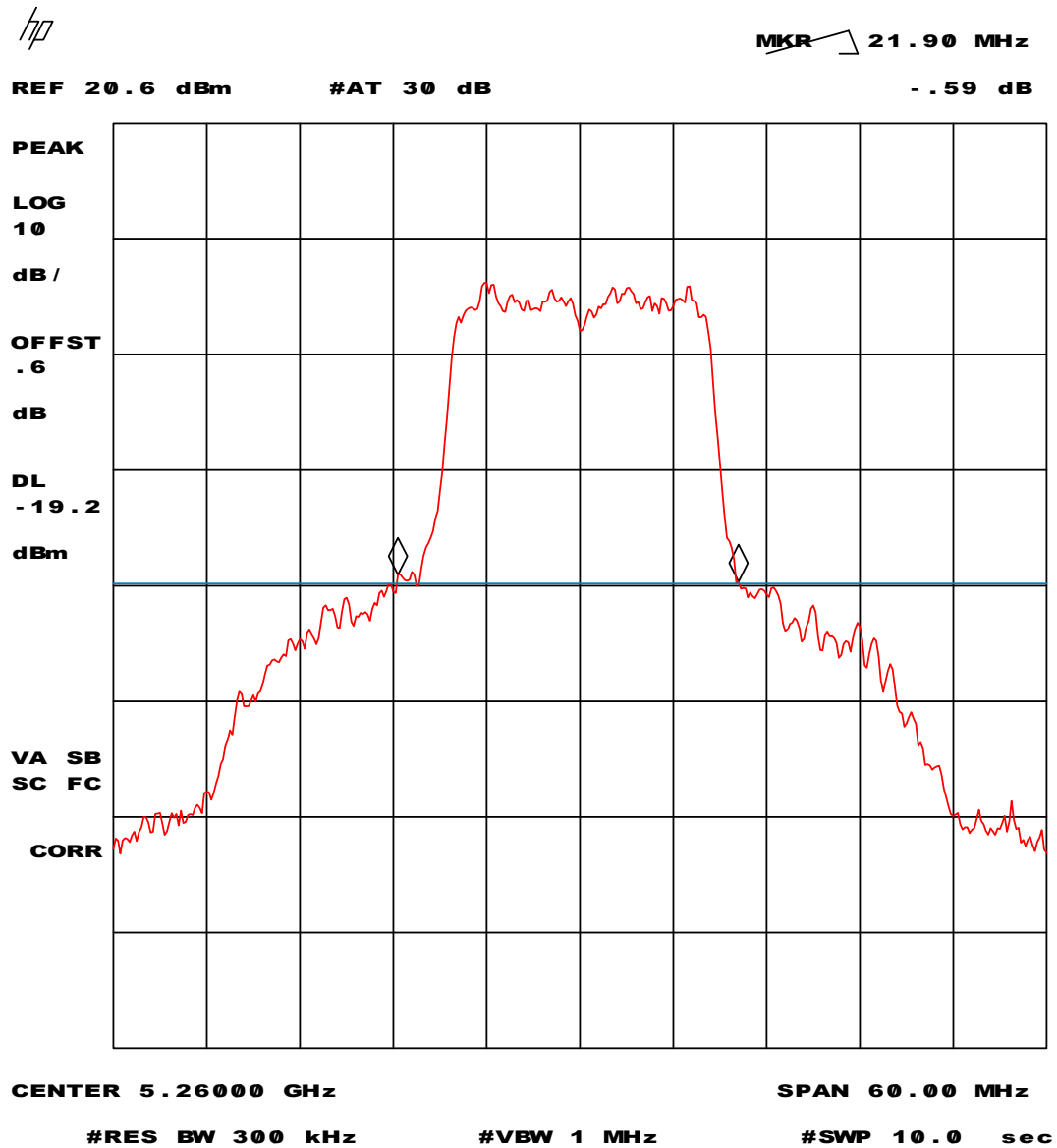


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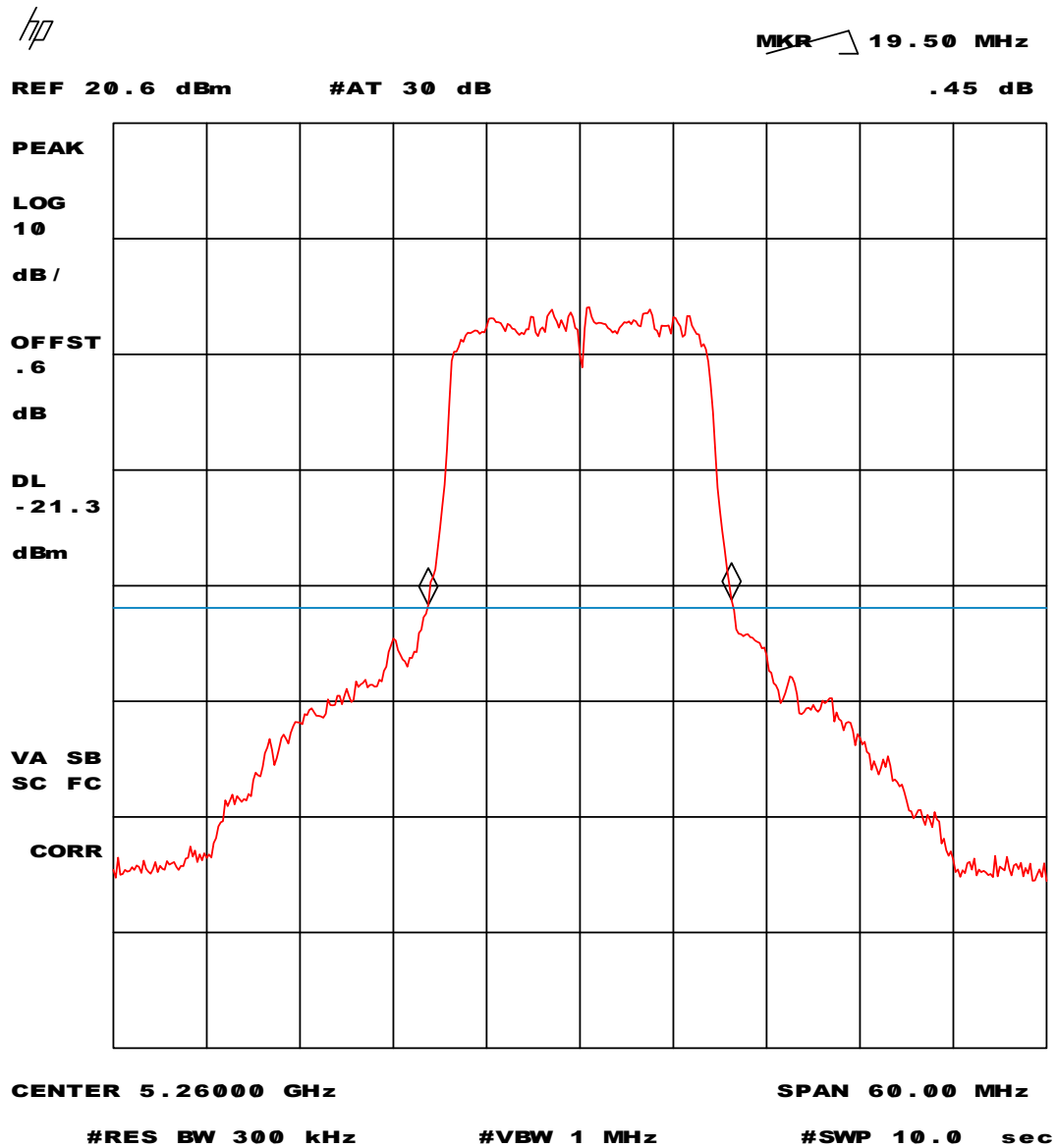
Plot 3 - Emission bandwidth (conducted, -26 dB).

Plot 3 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 18 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



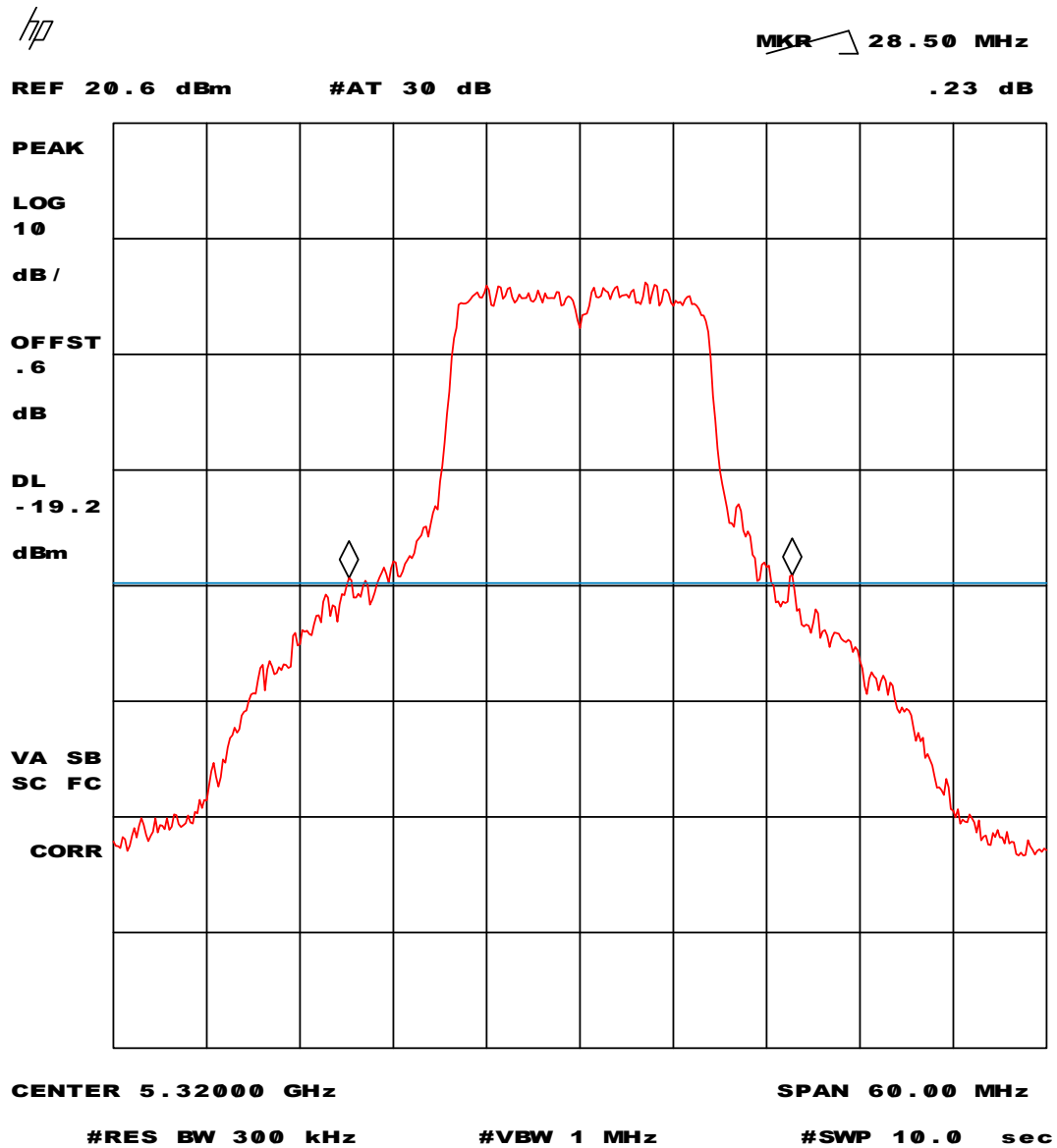
Plot 4 - Emission bandwidth (conducted, -26 dB).

Plot 4 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 36 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



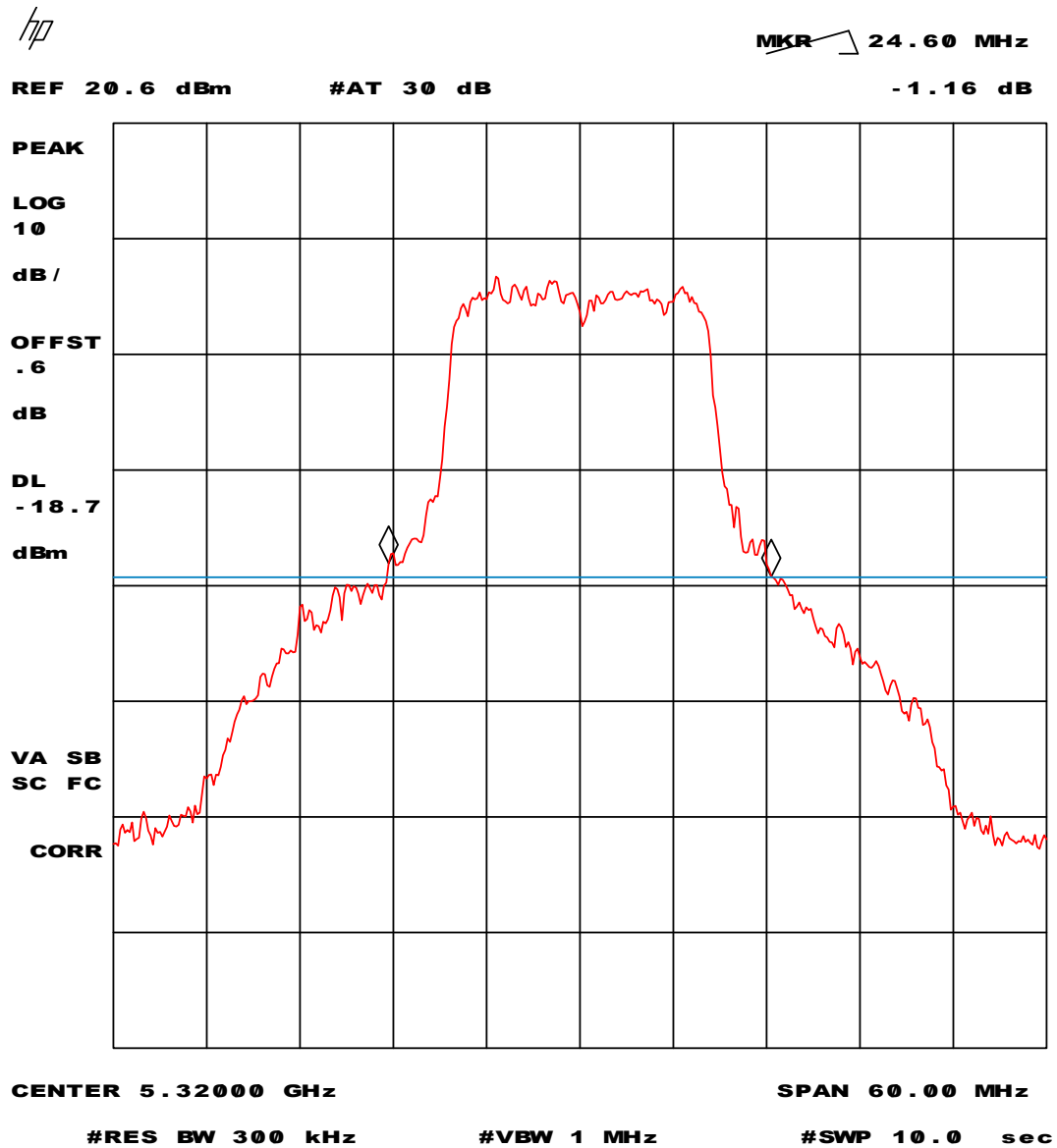
Plot 5 - Emission bandwidth (conducted, -26 dB).

Plot 5 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 54 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



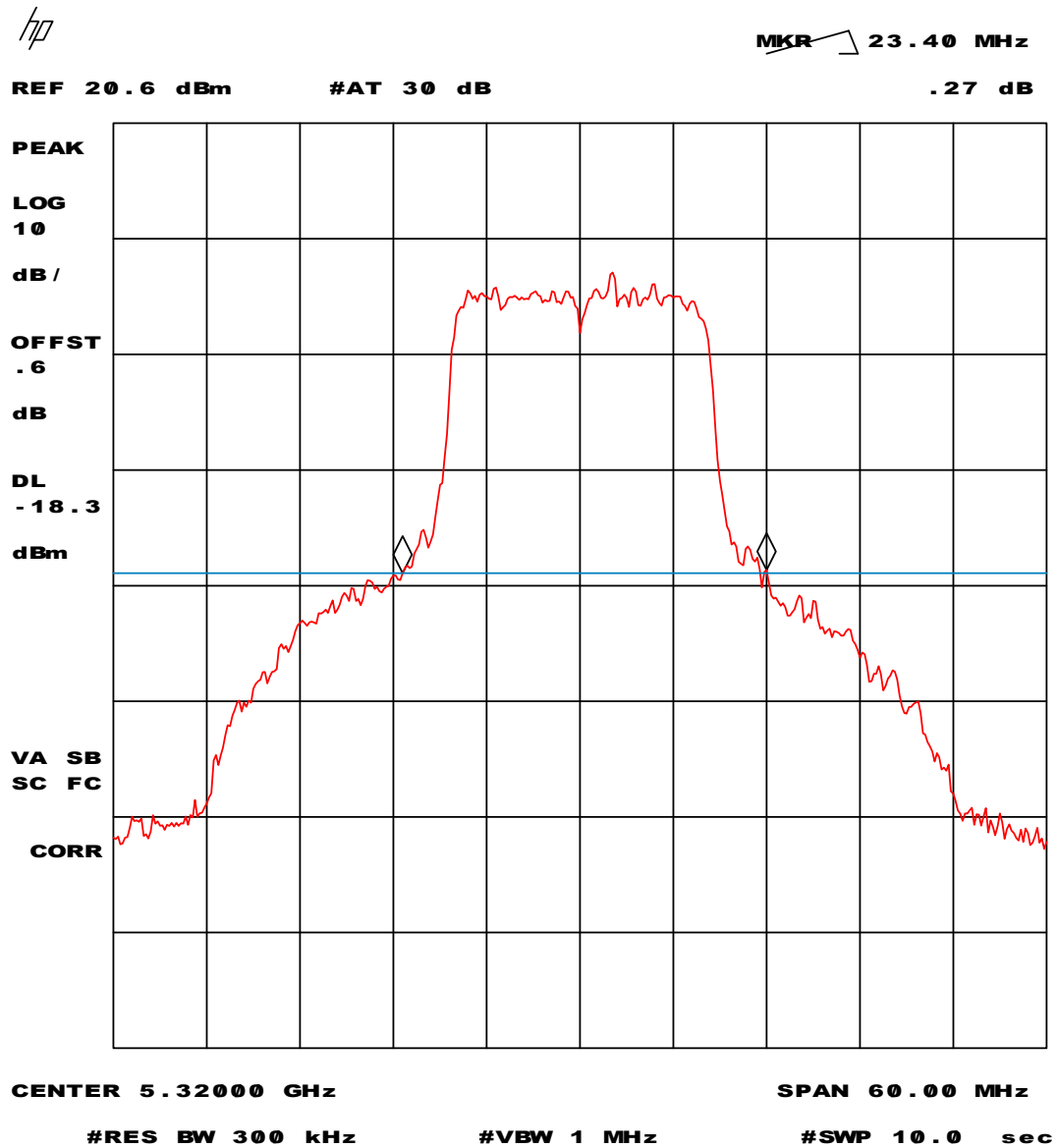
Plot 6 - Emission bandwidth (conducted, -26 dB).

Plot 6 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 6 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



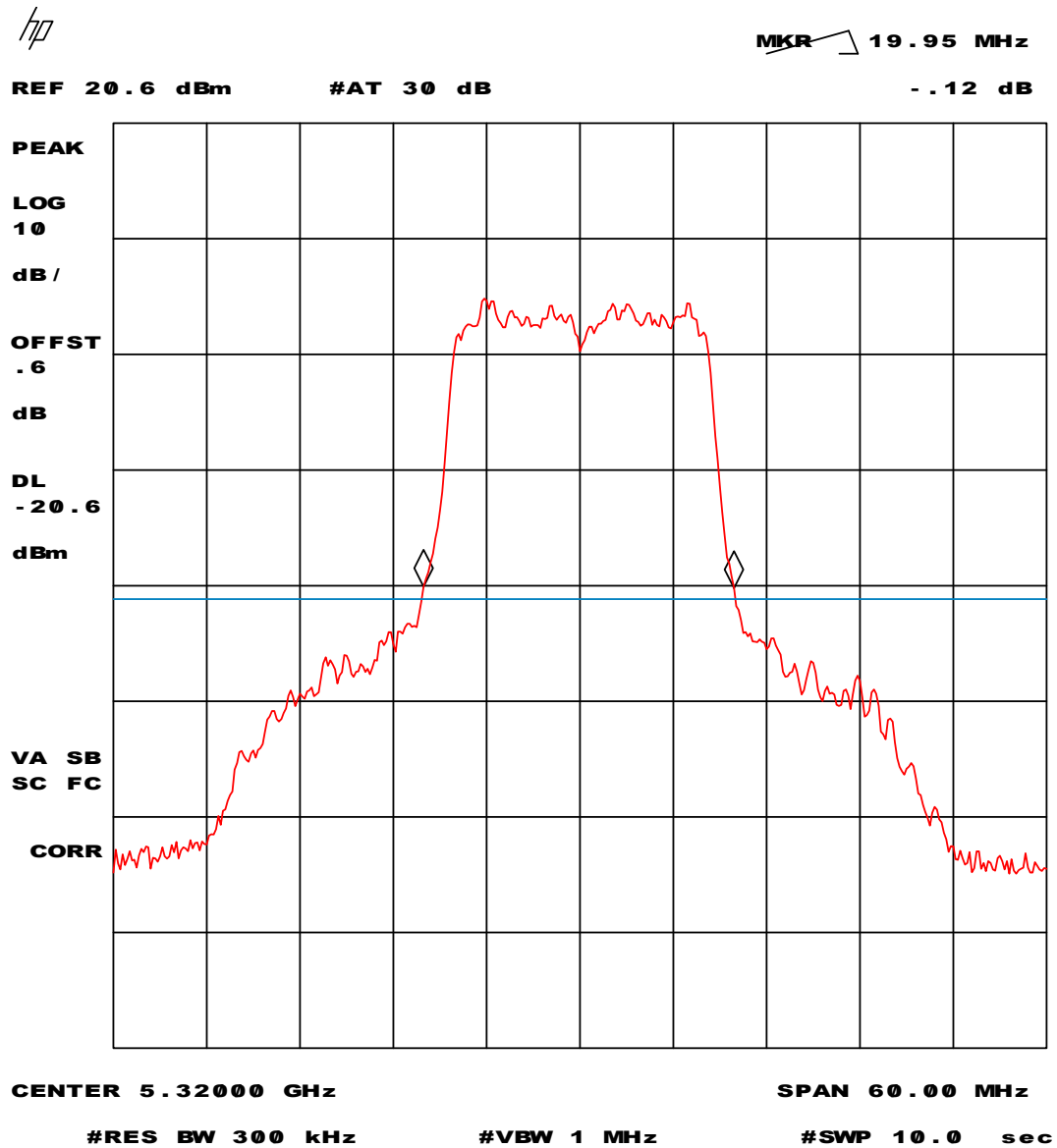
Plot 7 - Emission bandwidth (conducted, -26 dB).

Plot 7 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 9 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



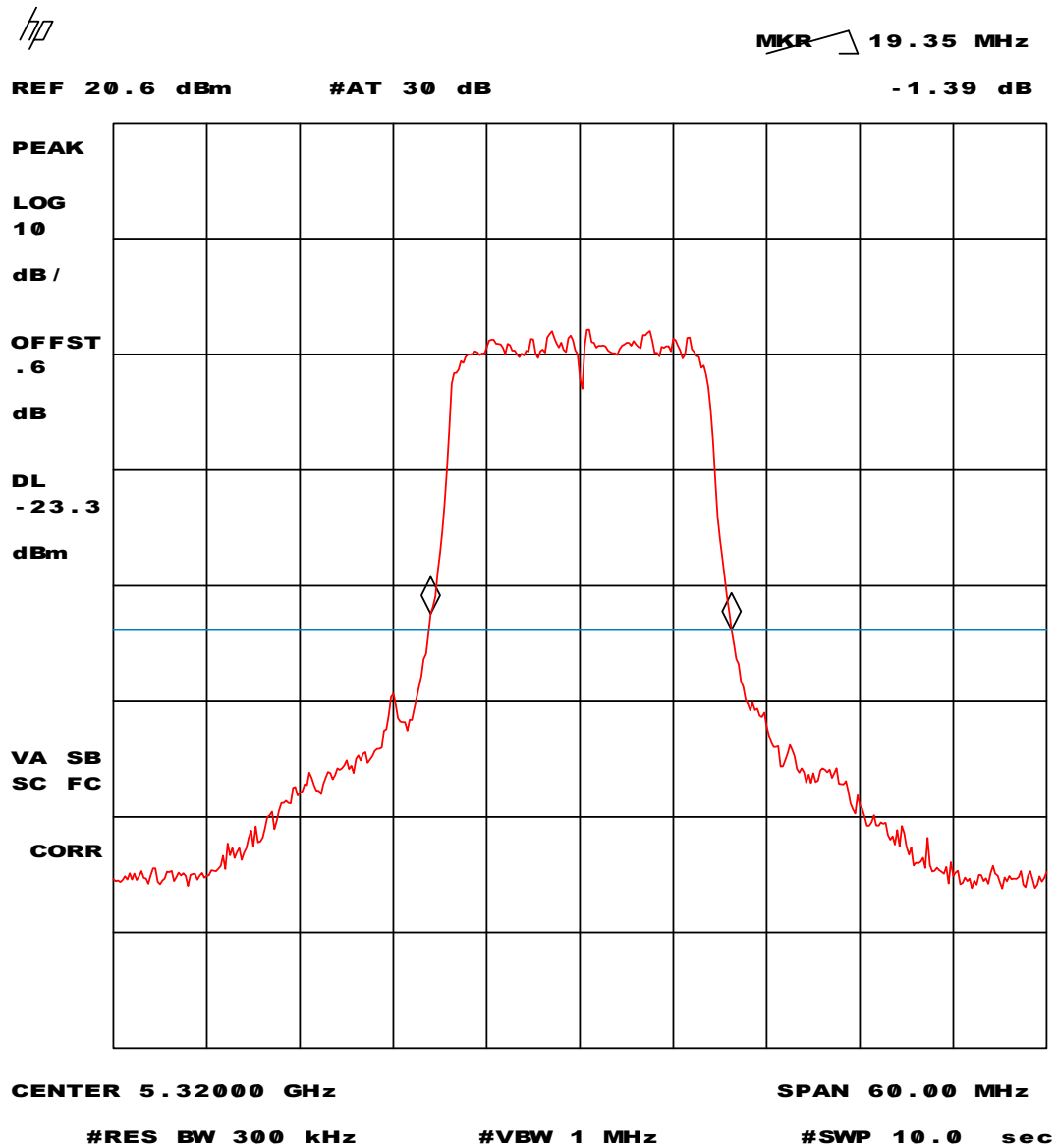
Plot 8 - Emission bandwidth (conducted, -26 dB).

Plot 8 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 18 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



Plot 9 - Emission bandwidth (conducted, -26 dB).

Plot 9 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 36 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.

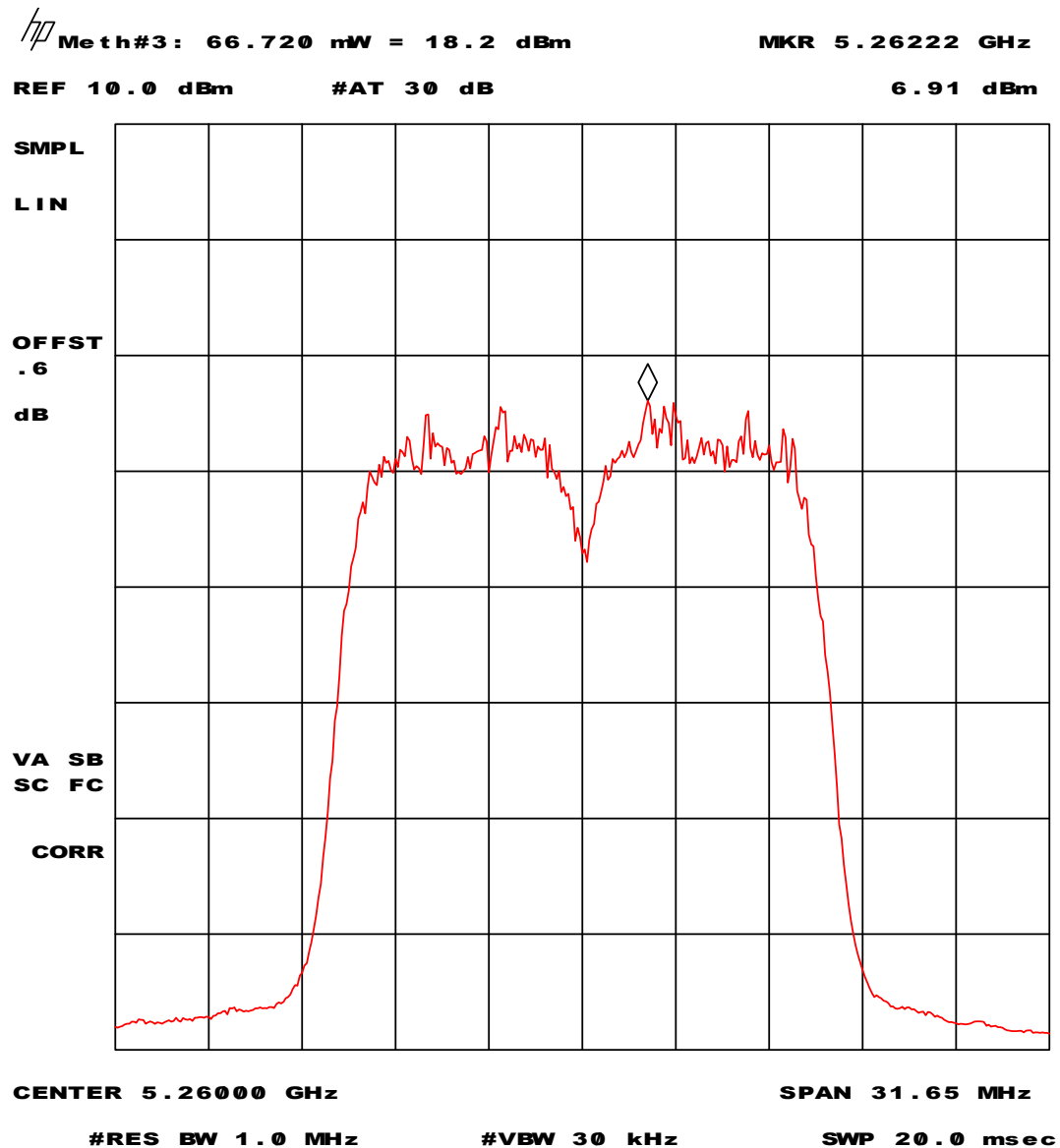


Plot 10 - Emission bandwidth (conducted, -26 dB).

Plot 10 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 54 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



5.2 Peak conducted transmit output power.

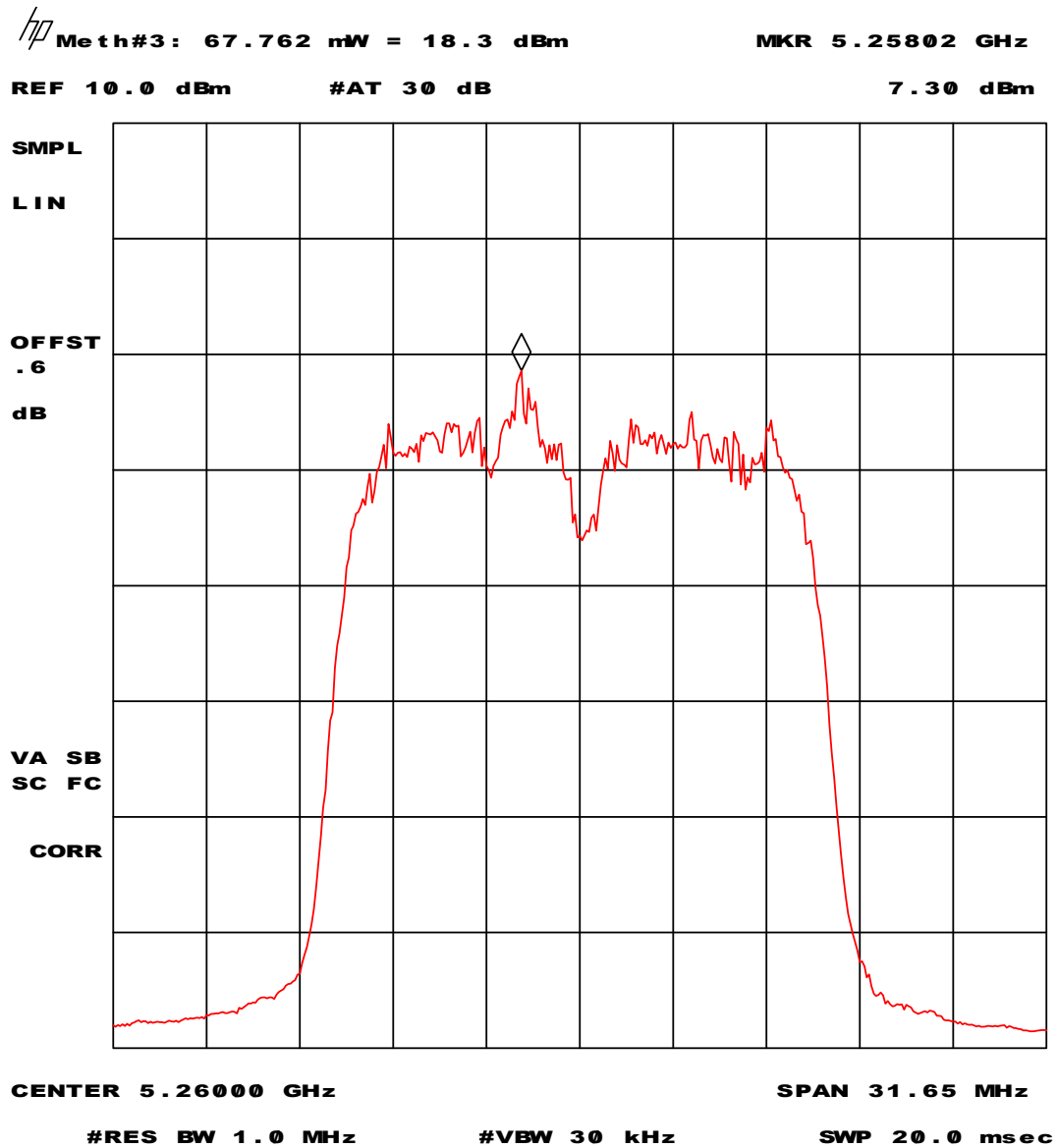


Plot 11 - Peak conducted transmit output power.

Plot 11 depicts the peak conducted transmit output power with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 6 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

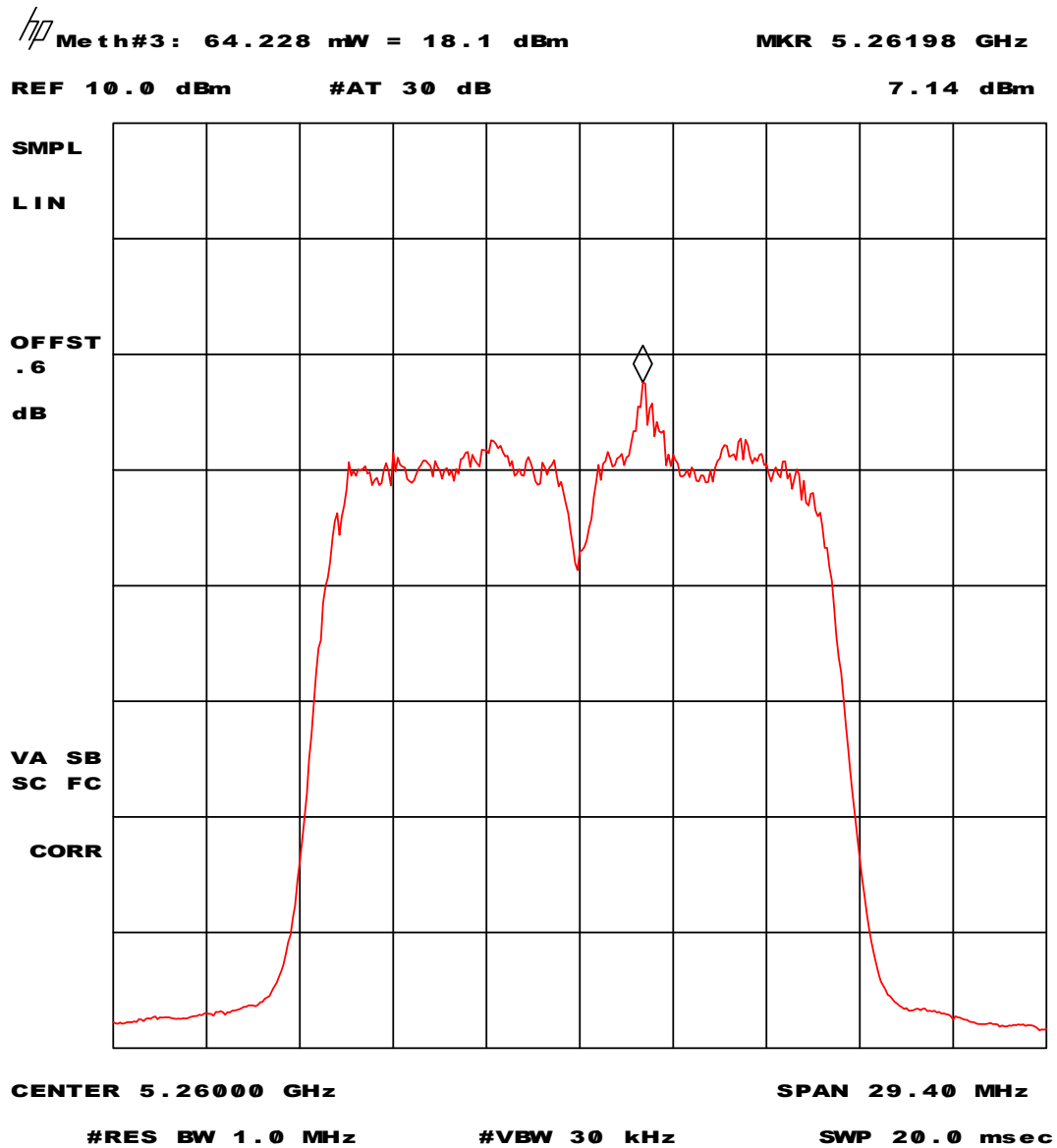


Plot 12 - Peak conducted transmit output power.

Plot 12 depicts the peak conducted transmit output power with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 9 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

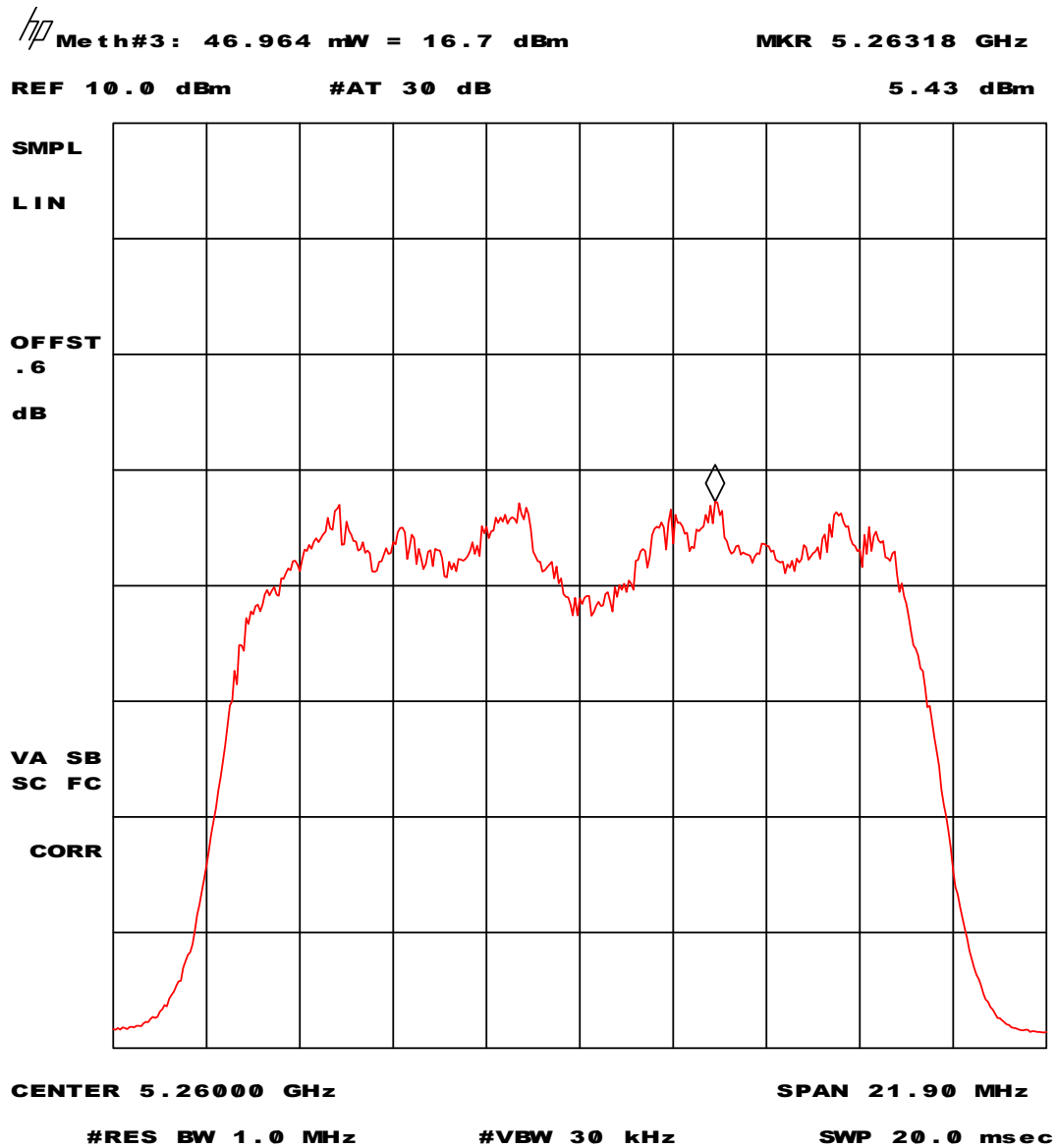


Plot 13 - Peak conducted transmit output power.

Plot 13 depicts the peak conducted transmit output power with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 18 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

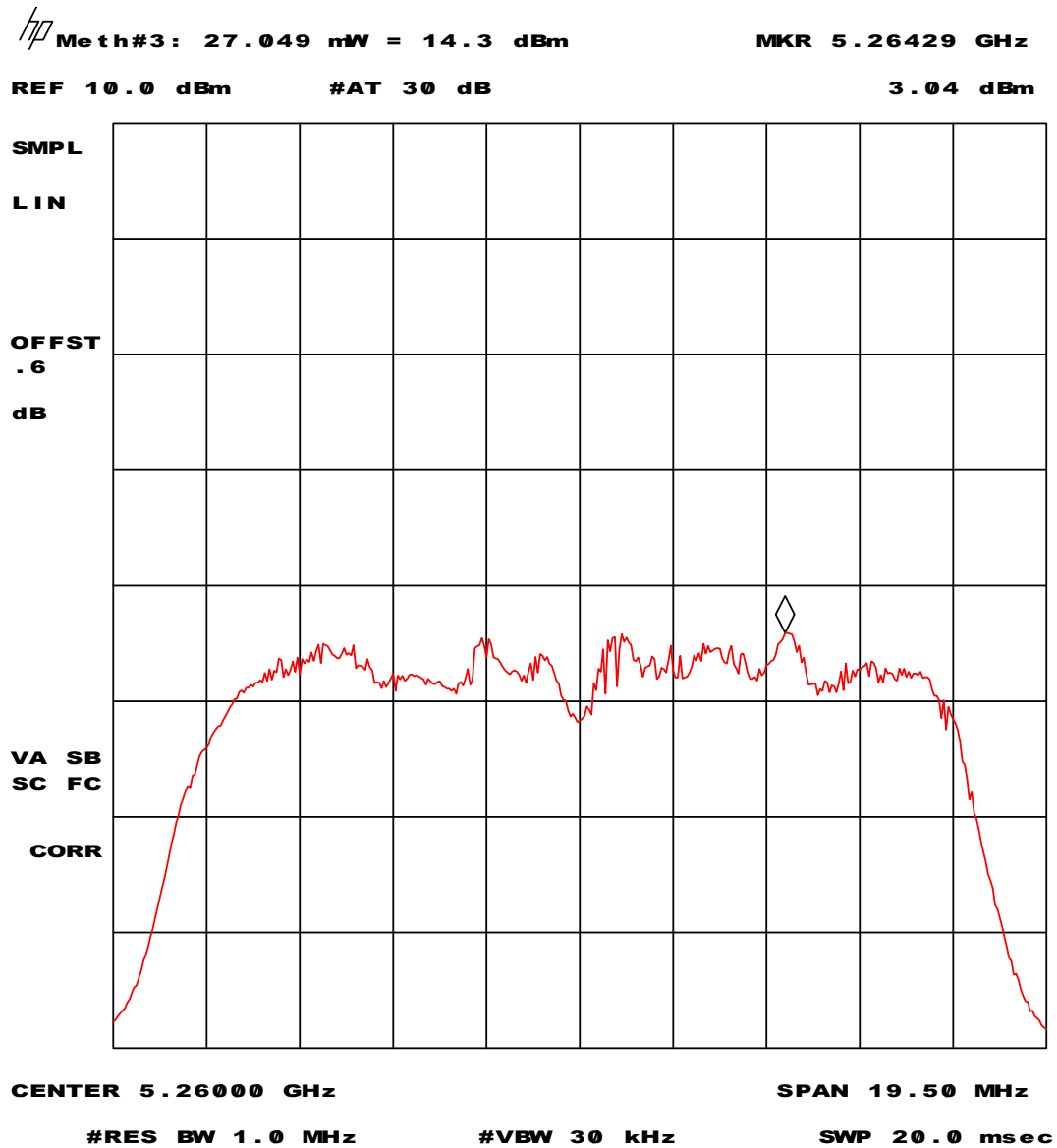


Plot 14 - Peak conducted transmit output power.

Plot 14 depicts the peak conducted transmit output power with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 36 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

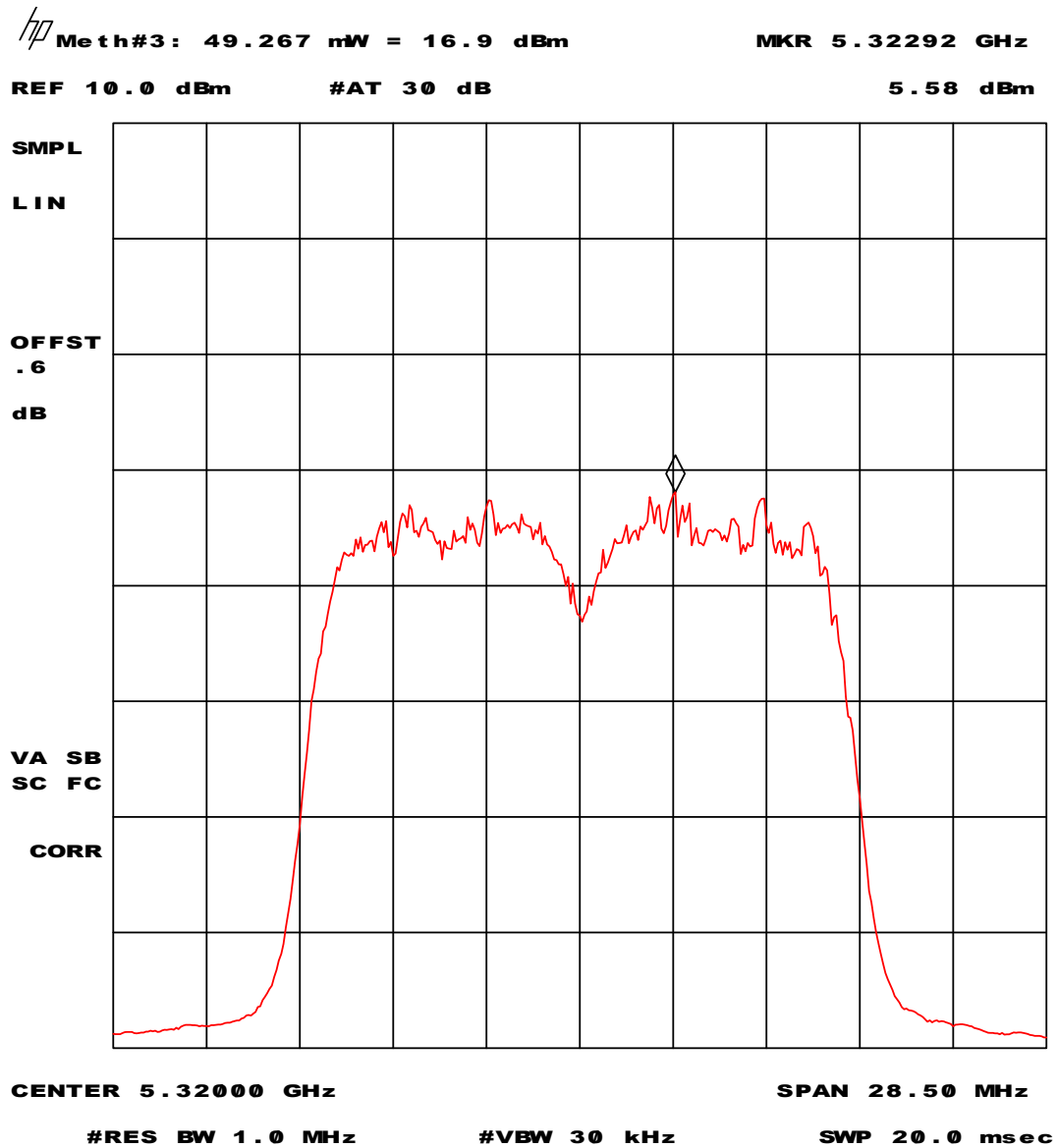


Plot 15 - Peak conducted transmit output power.

Plot 15 depicts the peak conducted transmit output power with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 54 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

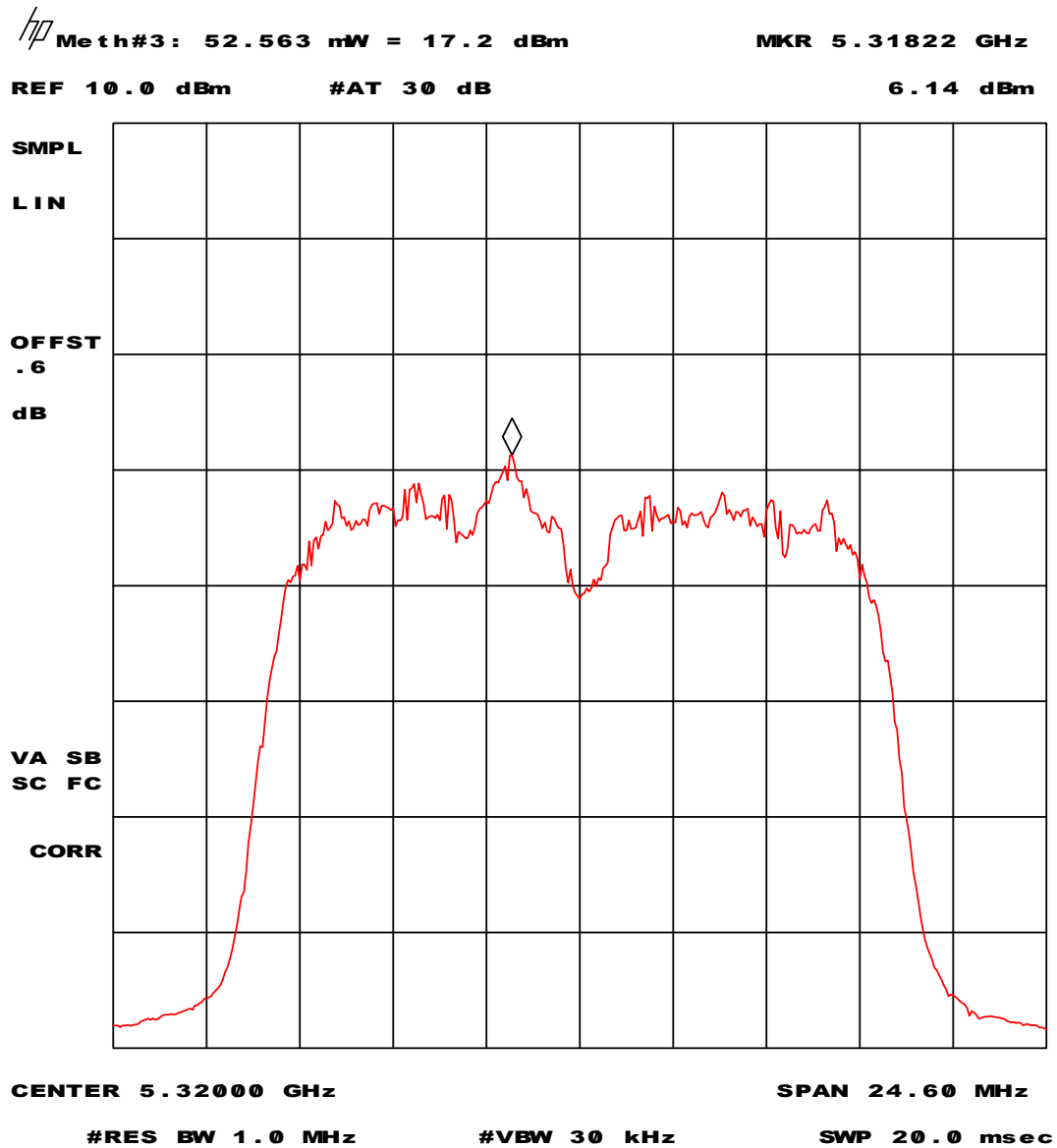


Plot 16 - Peak conducted transmit output power.

Plot 16 depicts the peak conducted transmit output power with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 6 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

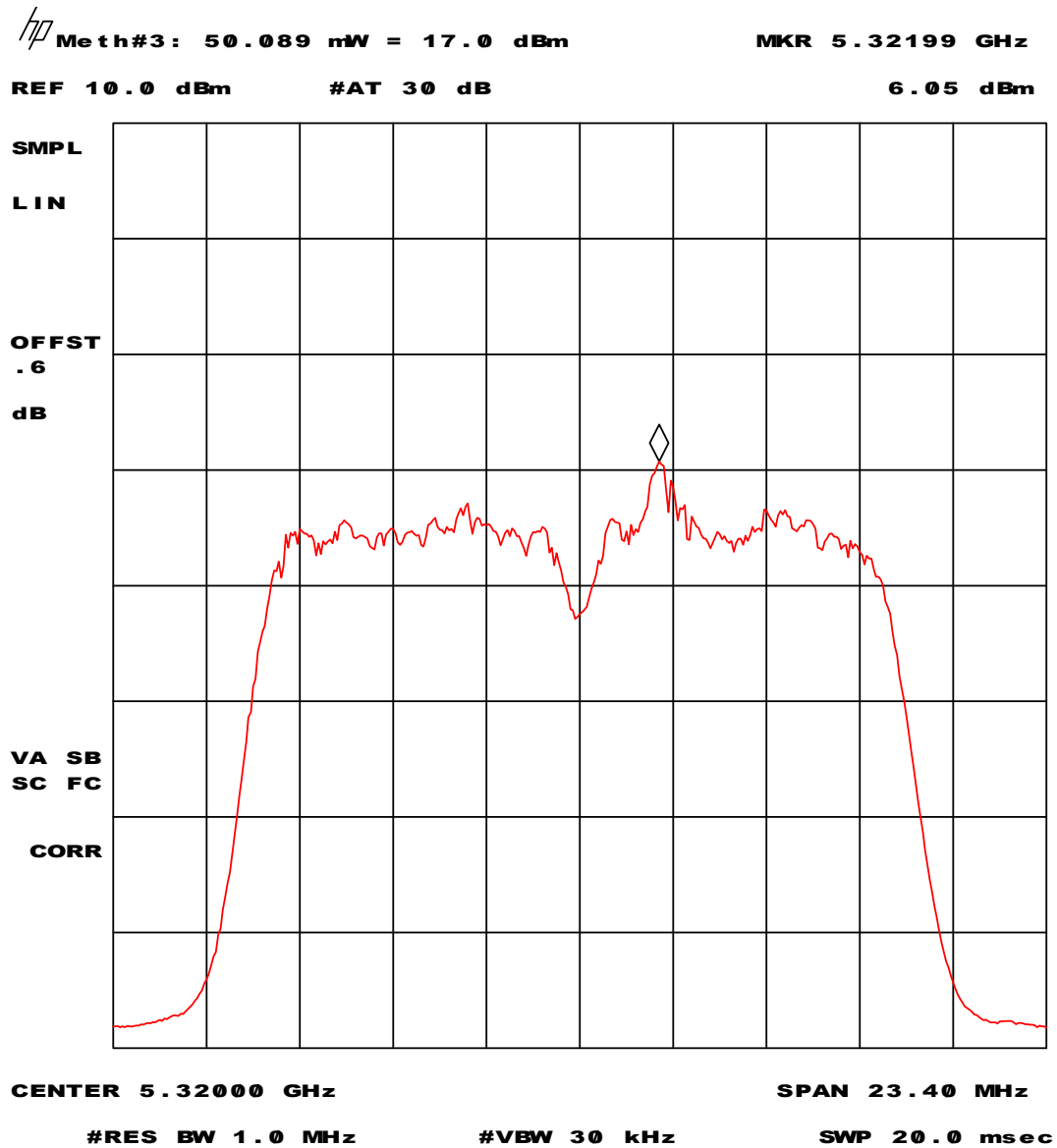


Plot 17 - Peak conducted transmit output power.

Plot 17 depicts the peak conducted transmit output power with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 9 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

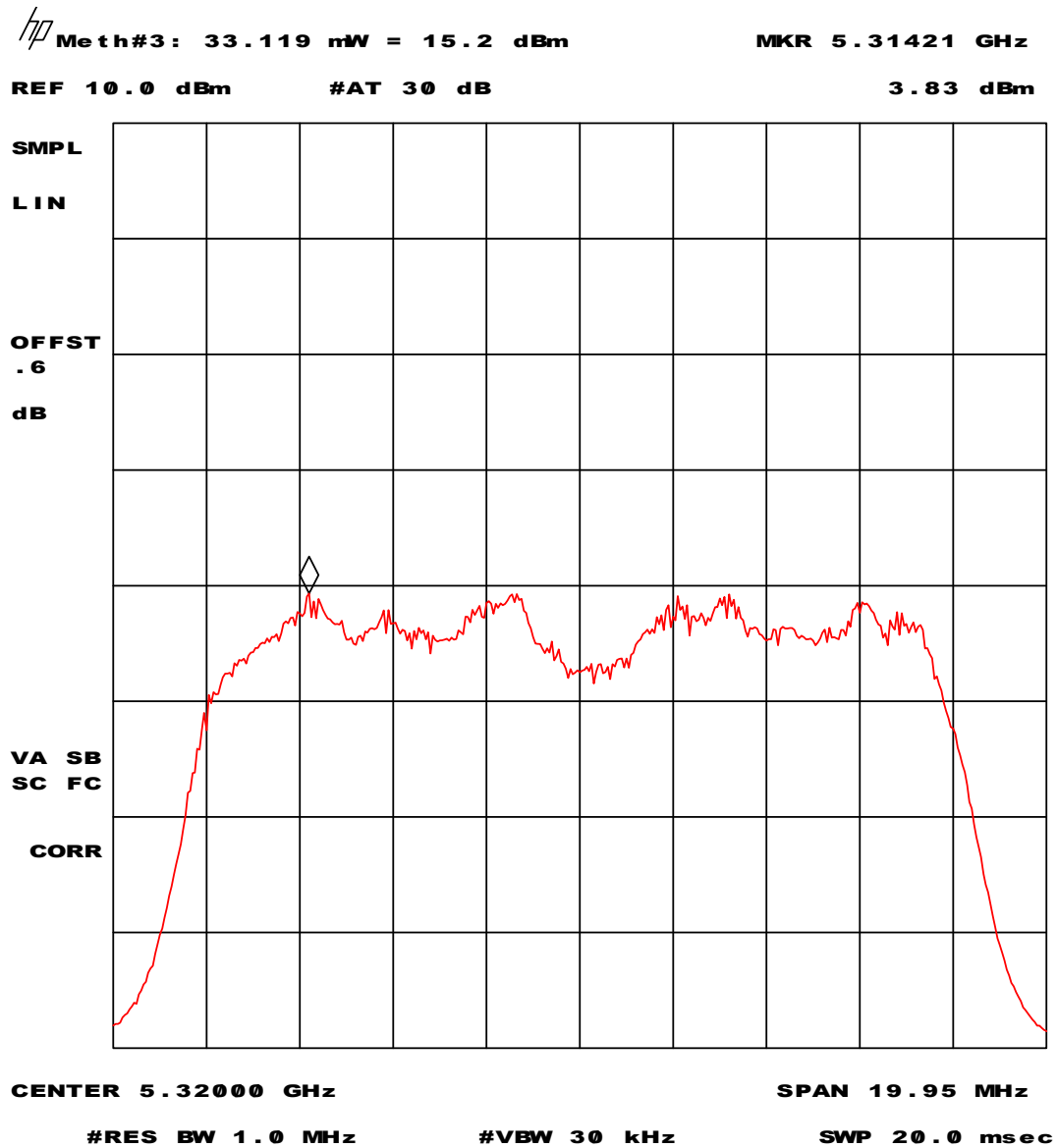


Plot 18 - Peak conducted transmit output power.

Plot 18 depicts the peak conducted transmit output power with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 18 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

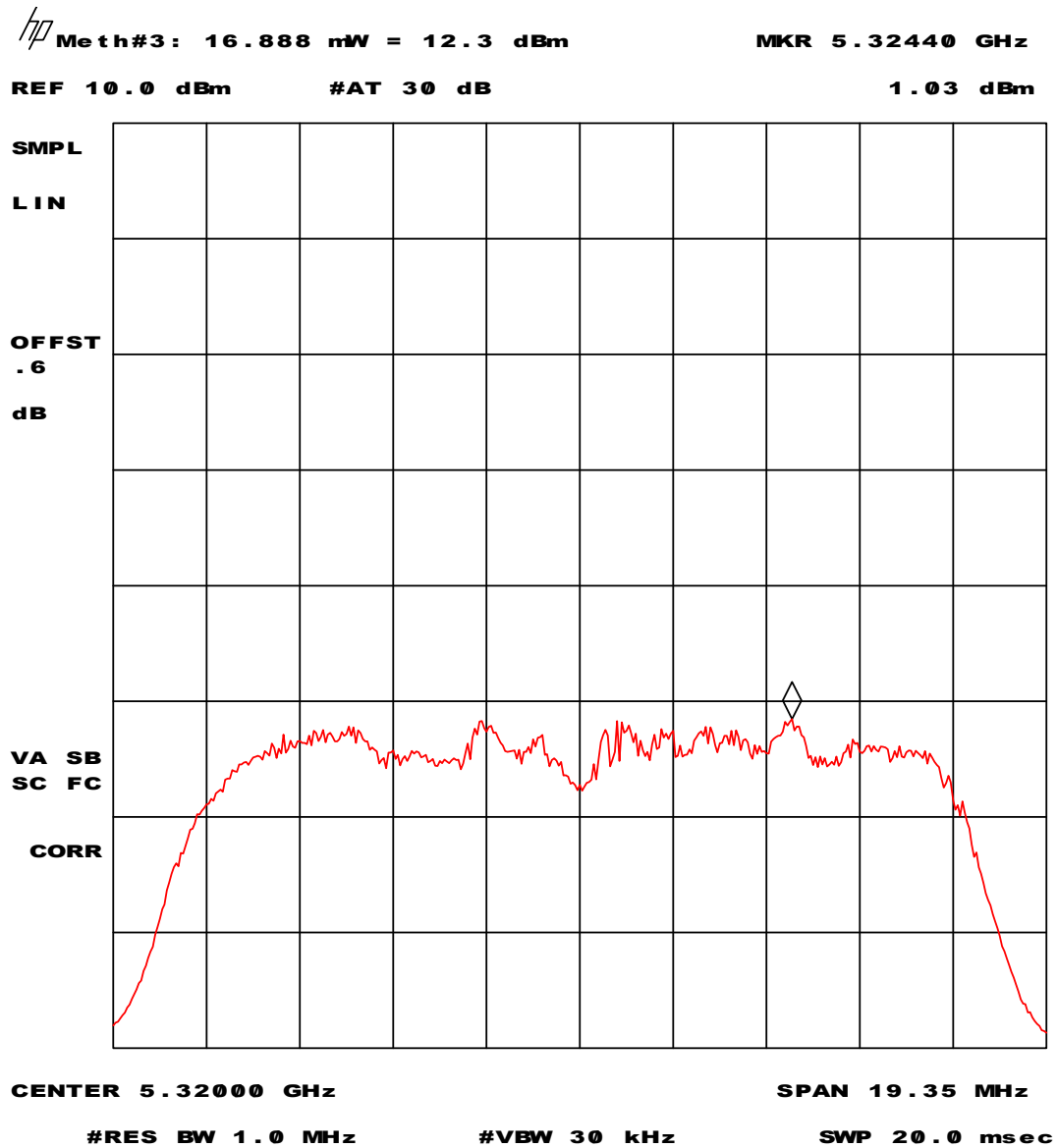


Plot 19 - Peak conducted transmit output power.

Plot 19 depicts the peak conducted transmit output power with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 36 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

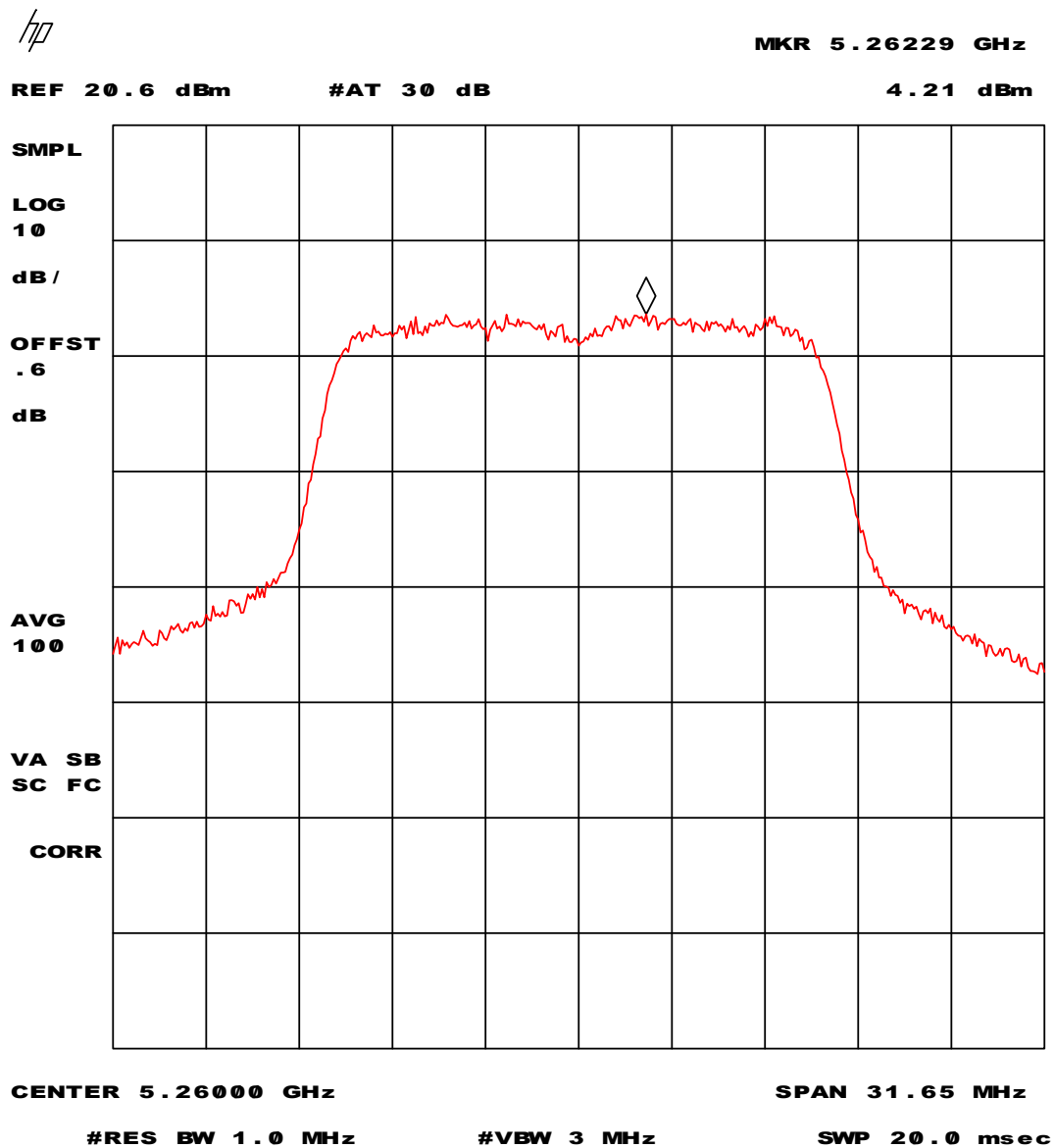


Plot 20 - Peak conducted transmit output power.

Plot 20 depicts the peak conducted transmit output power with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 54 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.

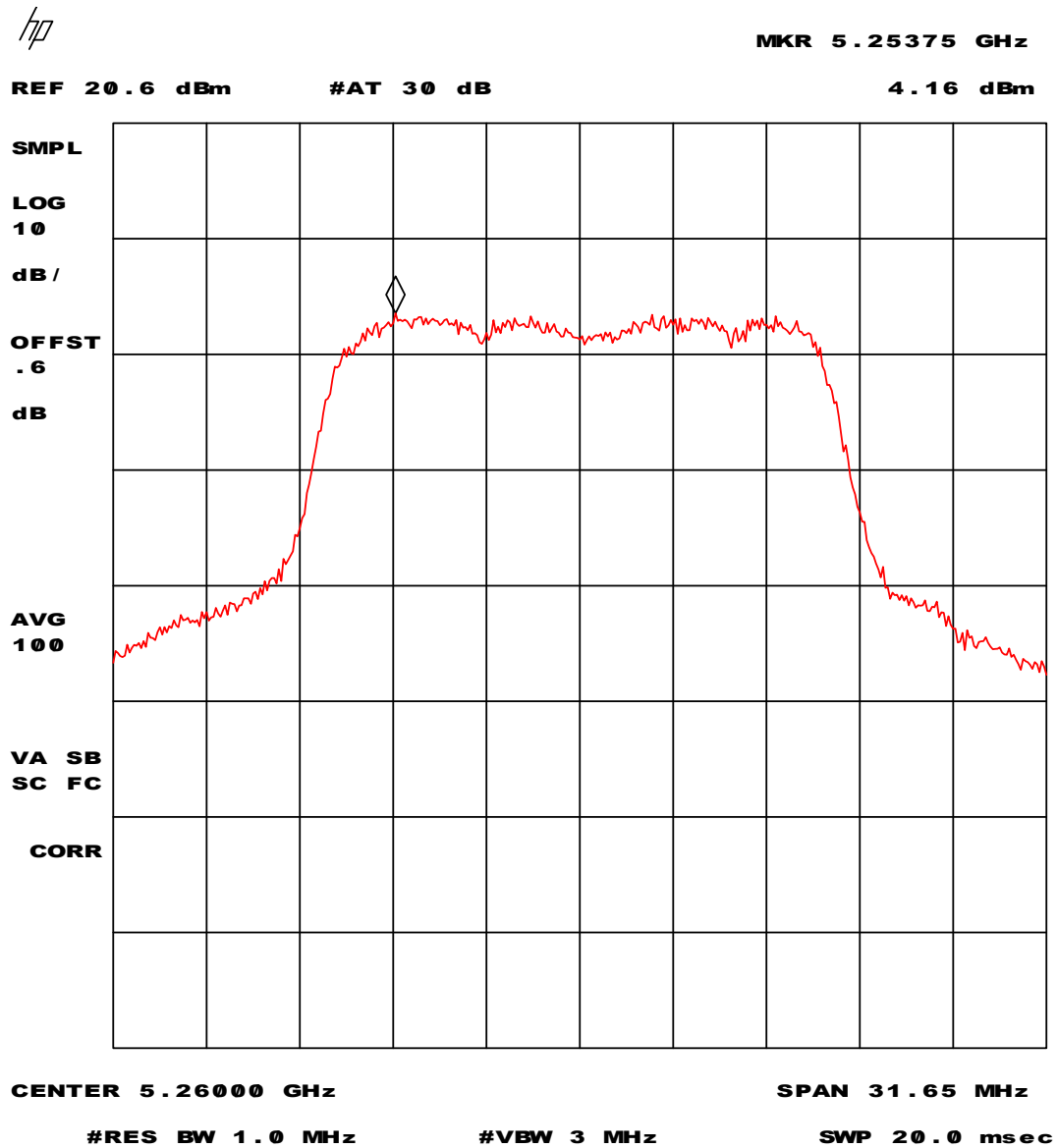


5.3 Peak power spectral density.



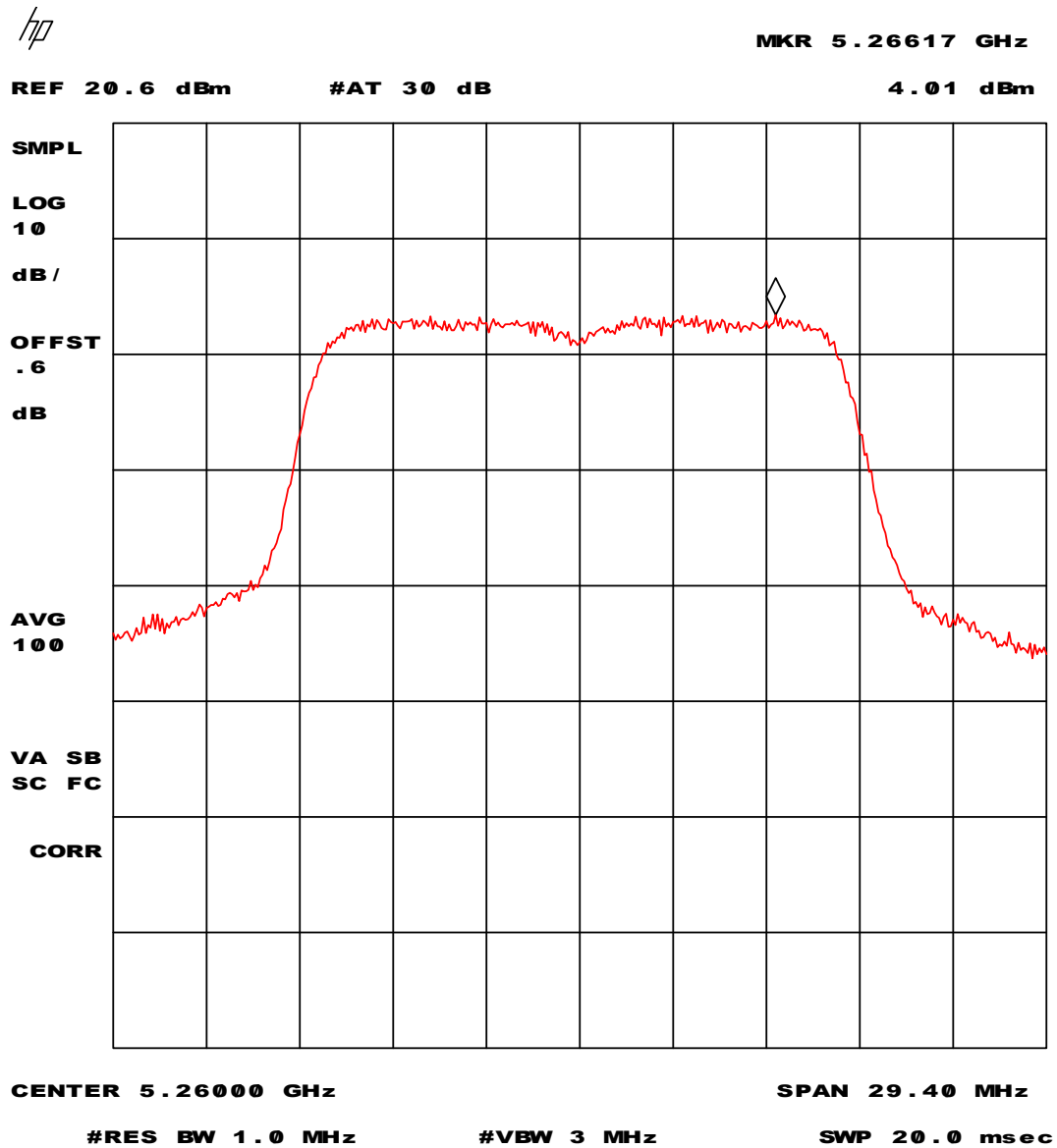
Plot 21 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 21 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 6 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



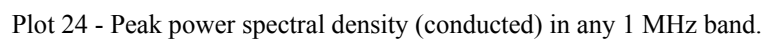
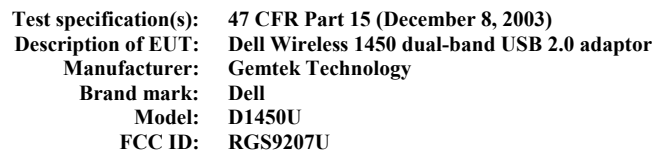
Plot 22 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 22 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 9 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.

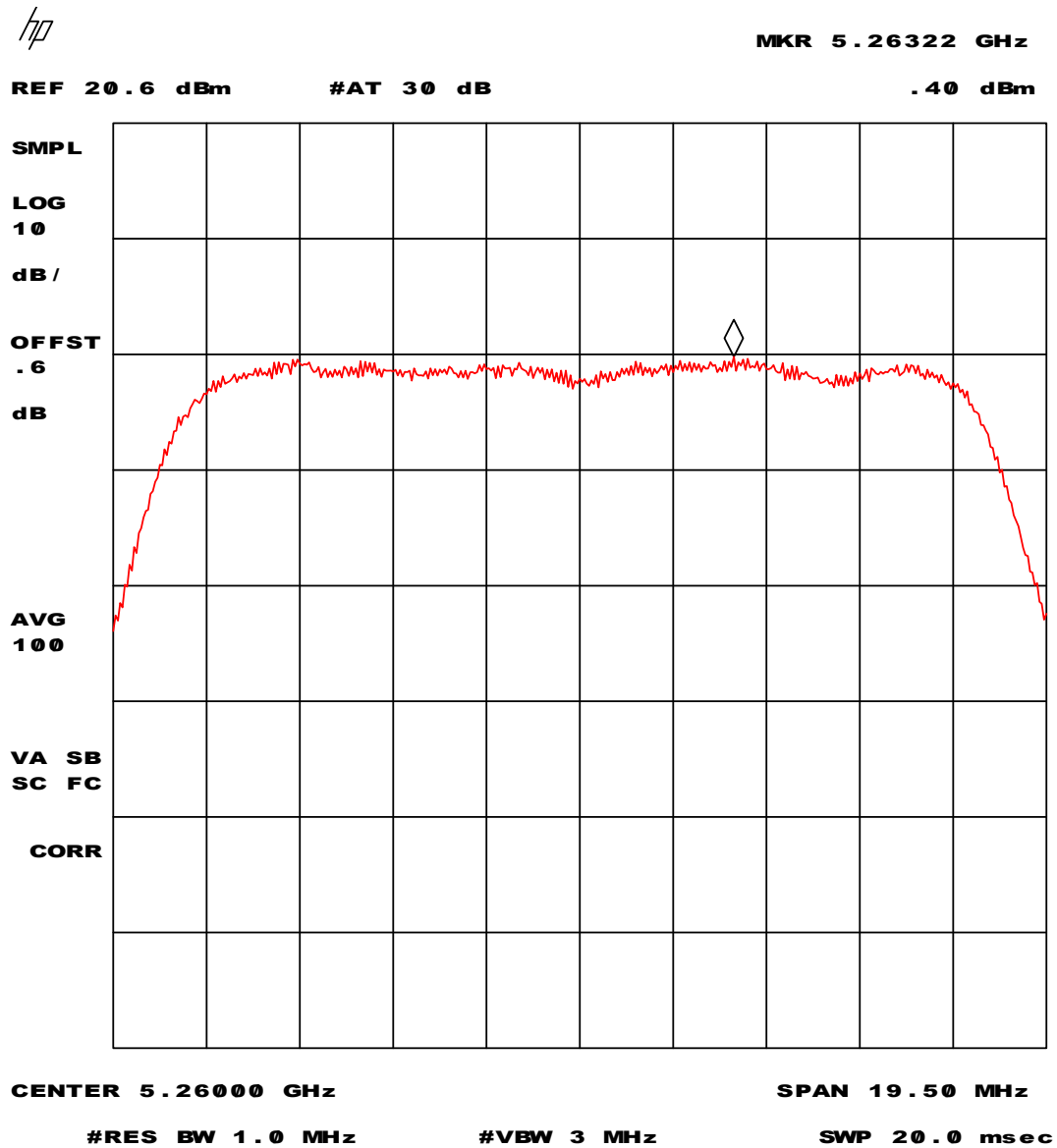


Plot 23 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 23 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 18 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



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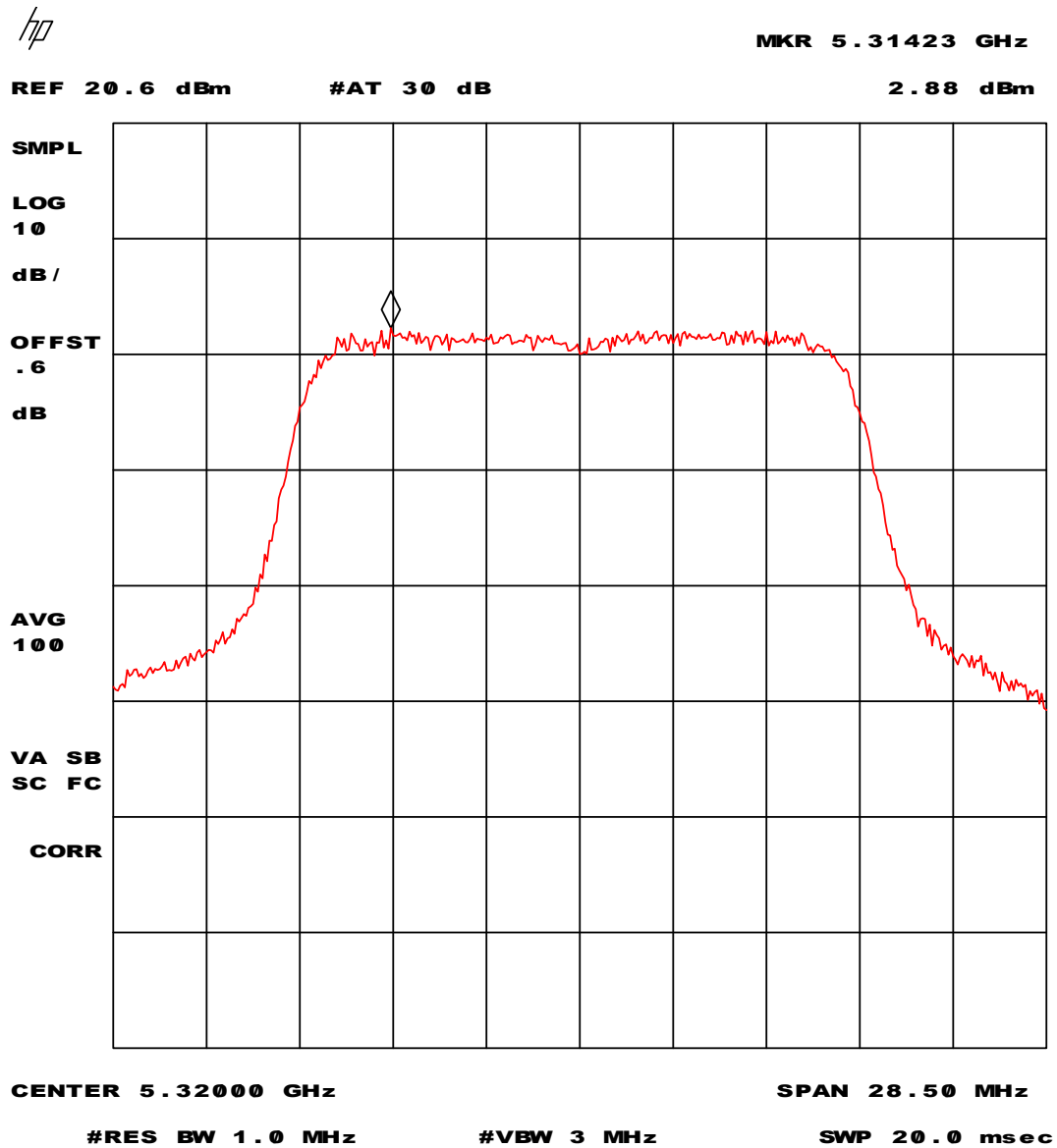


Plot 25 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 25 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 54 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

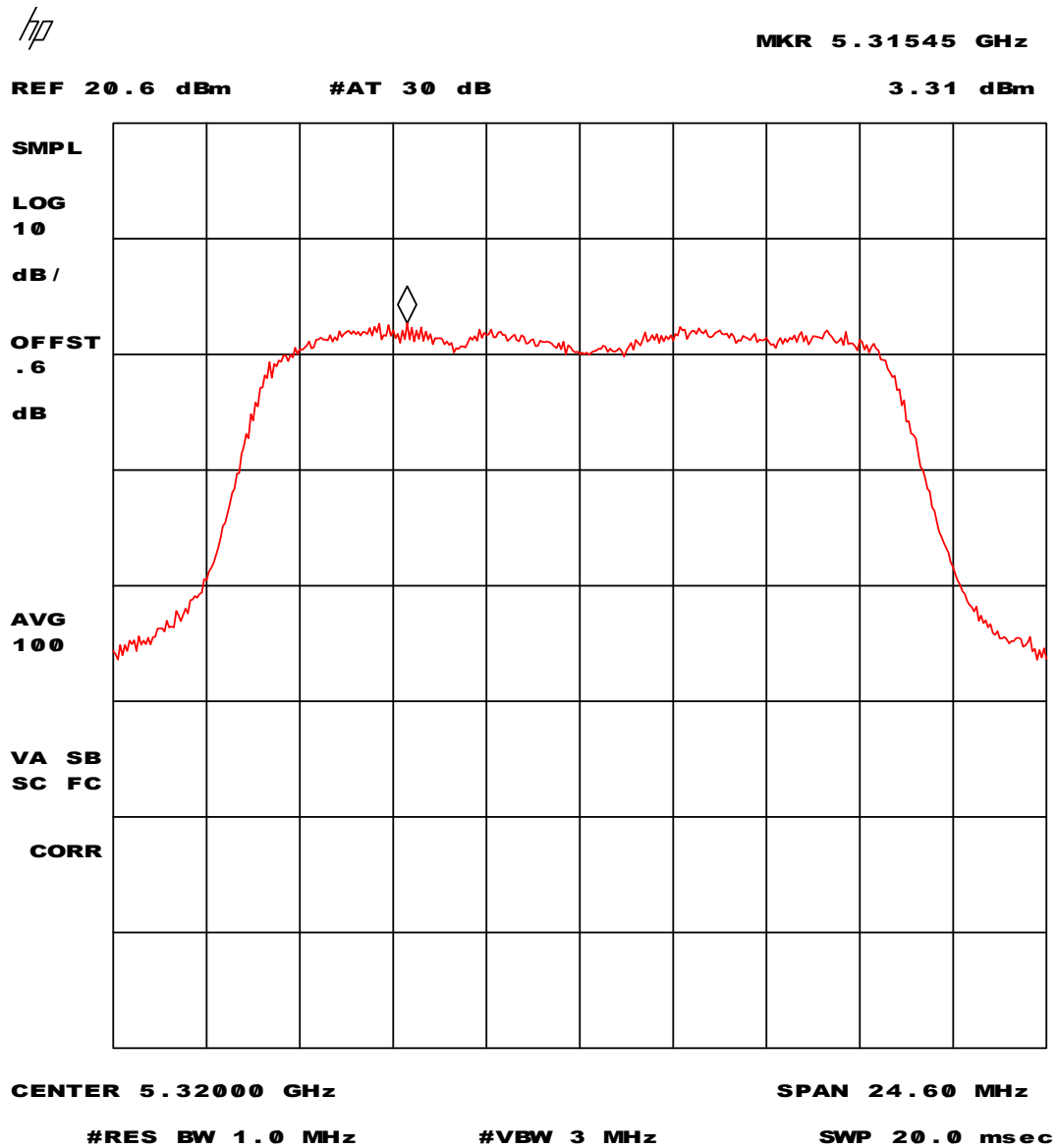


Plot 26 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 26 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 6 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

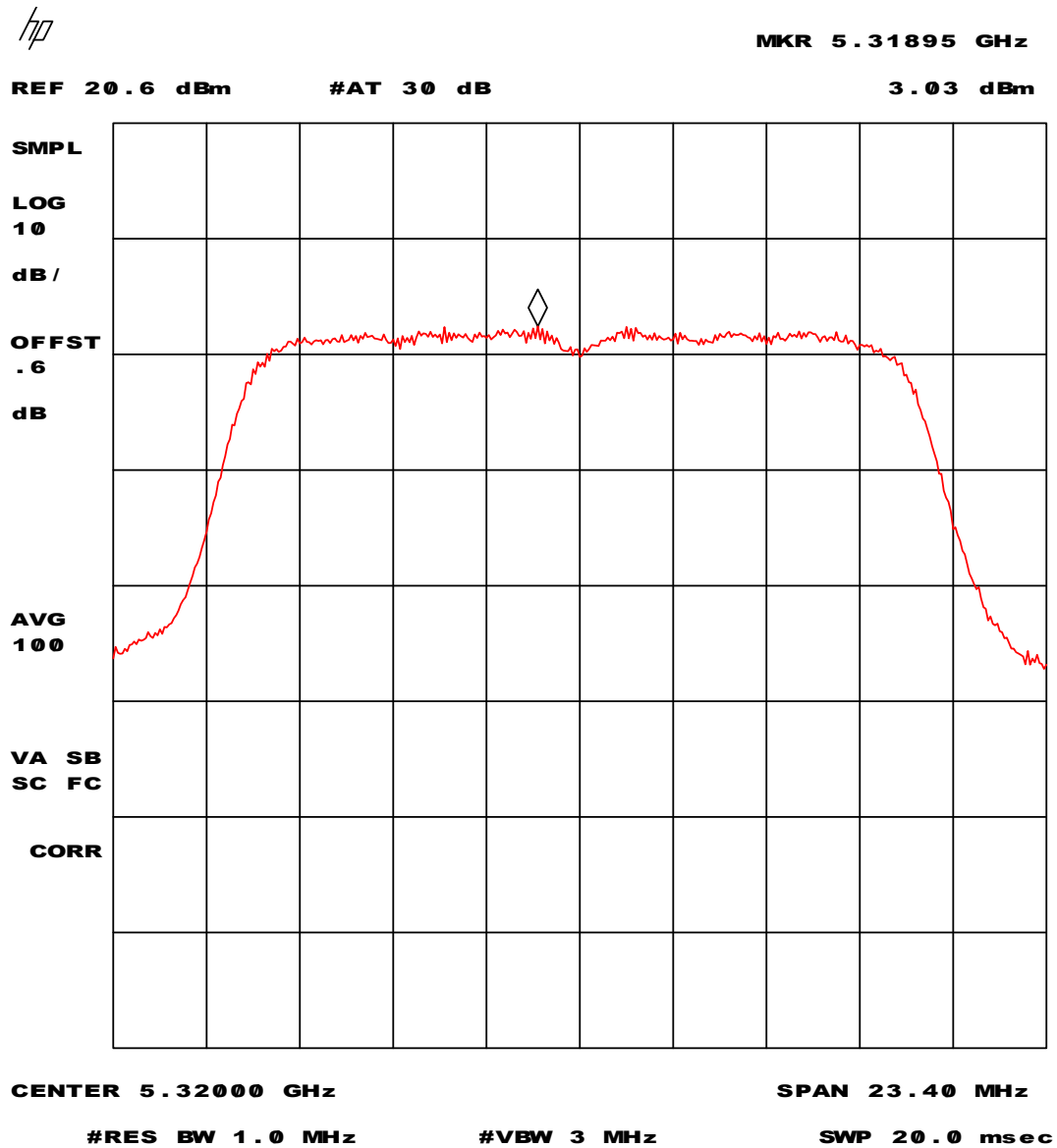


Plot 27 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 27 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 9 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

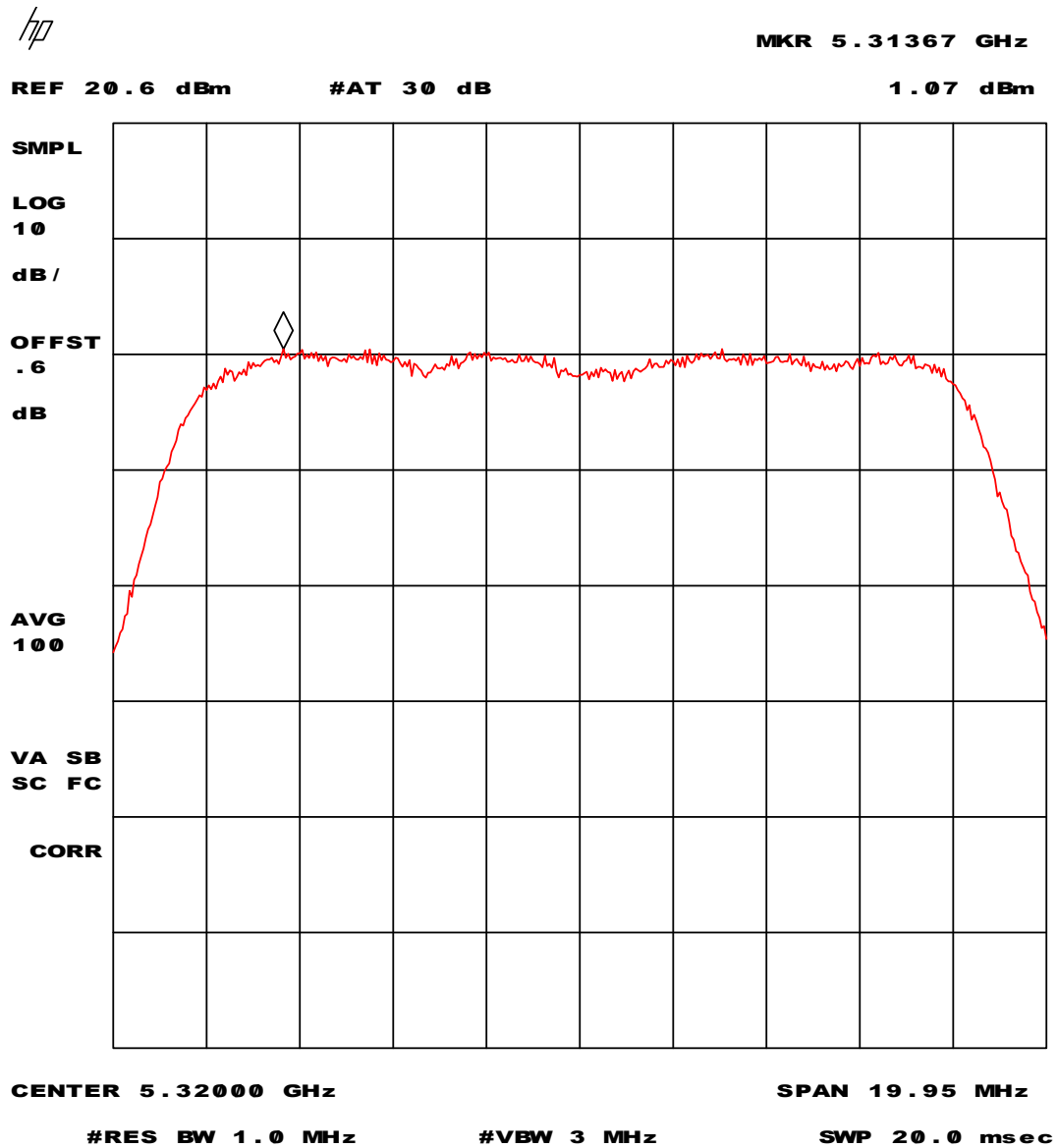


Plot 28 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 28 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 18 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

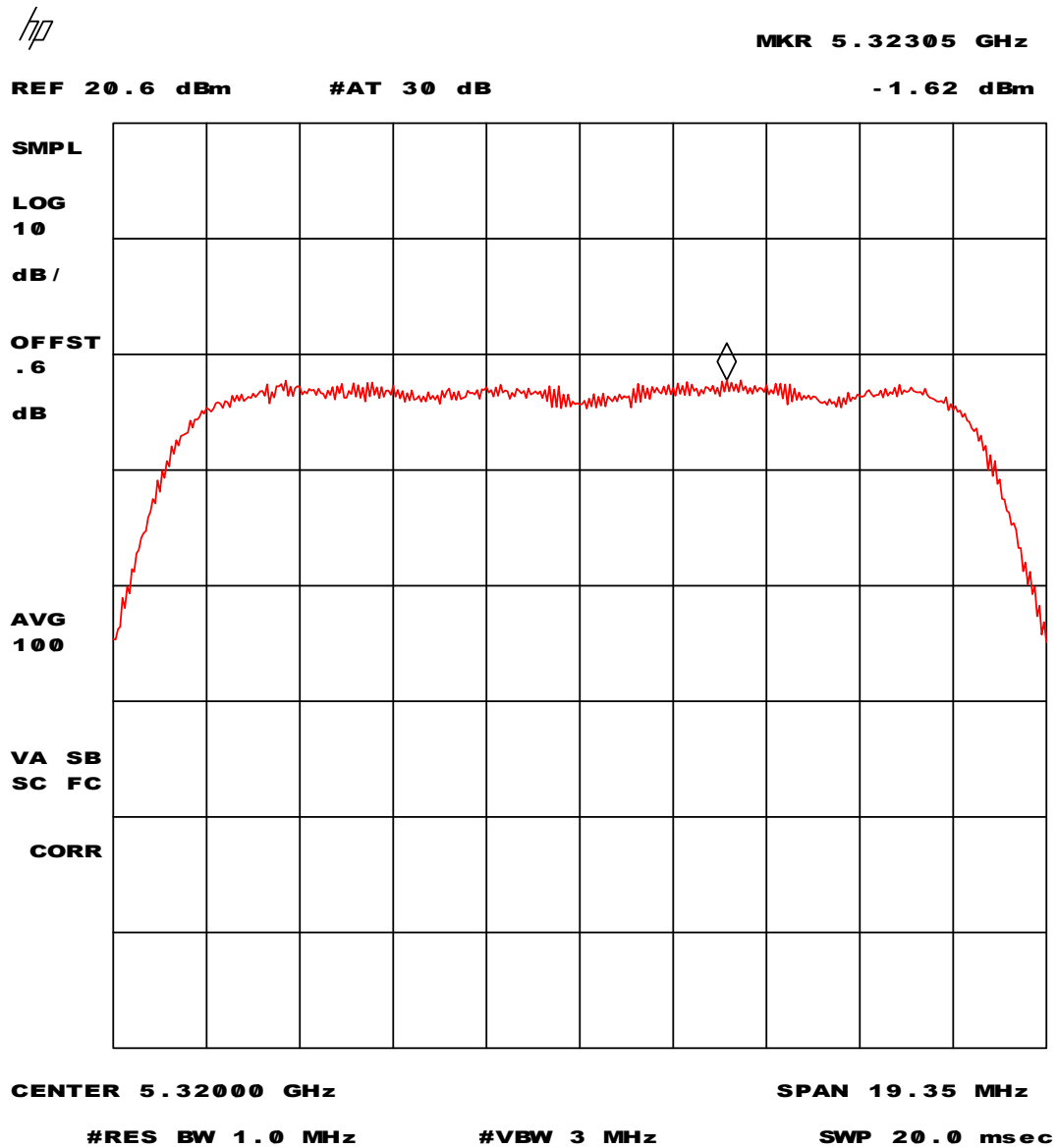


Plot 29 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 29 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 36 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U

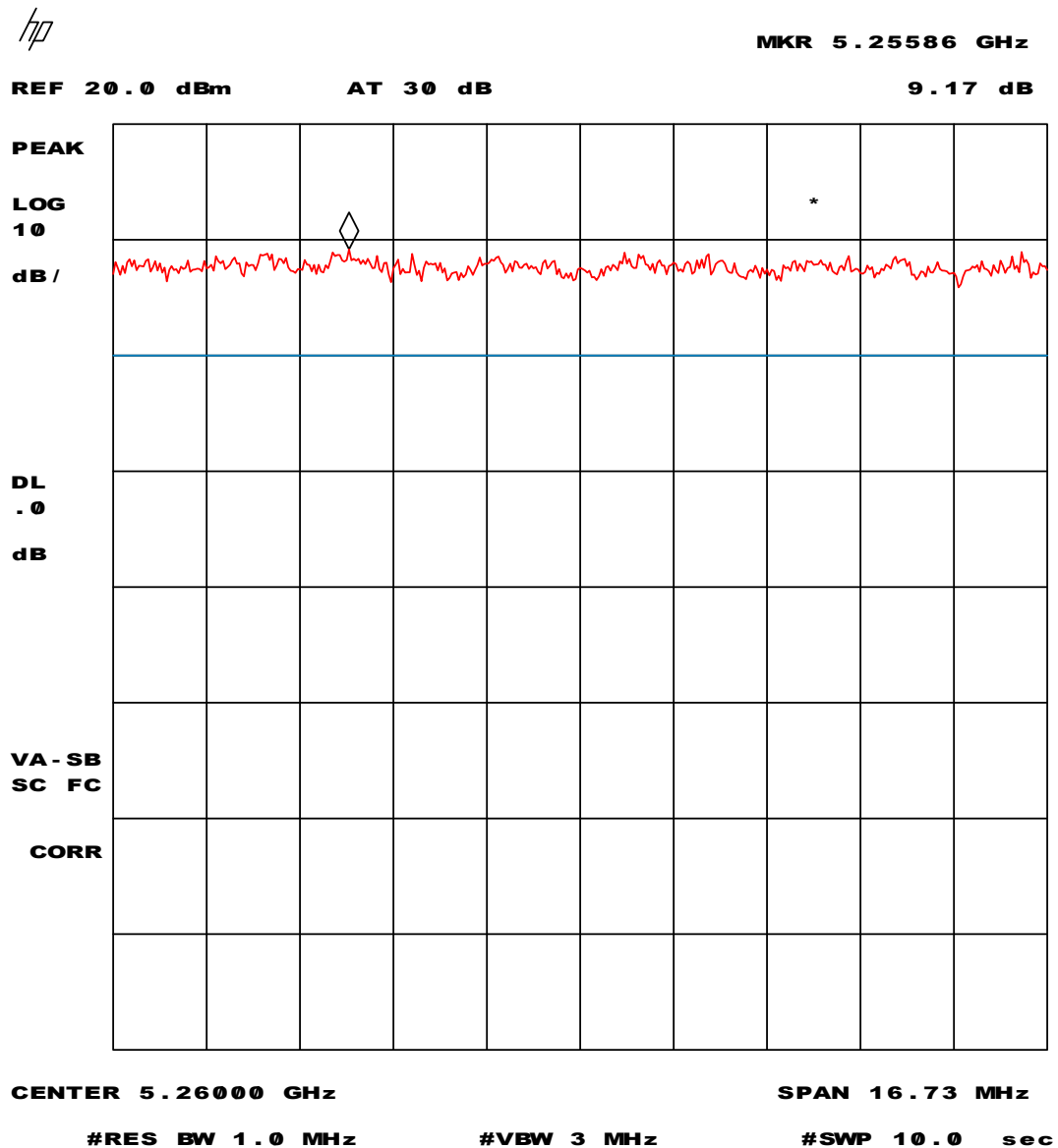


Plot 30 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 30 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 54 Mbit/s. Corrected (offset) for measurement cable losses of 0.6 dB.

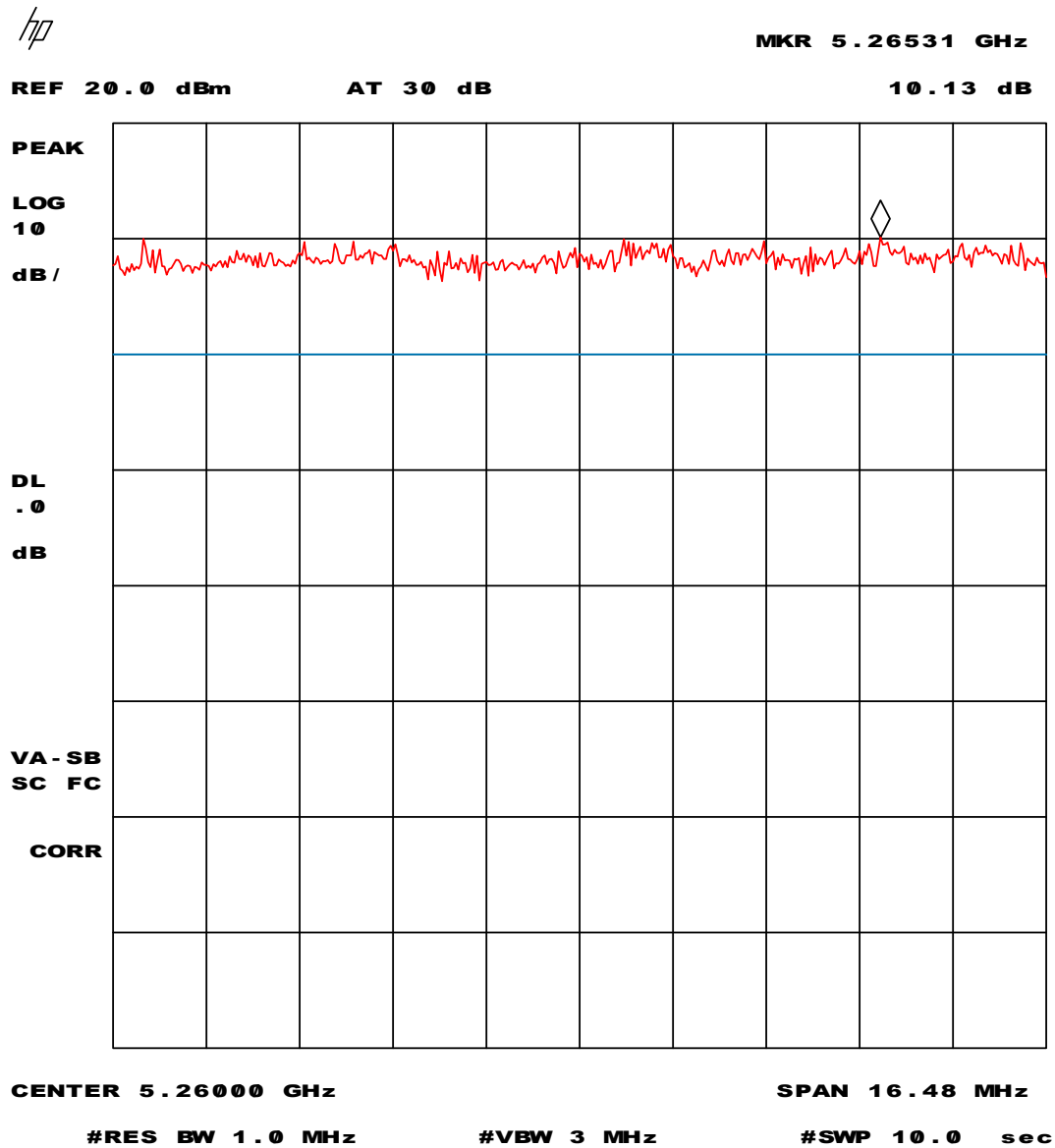


5.4 Ratio of the peak excursion of the modulation envelope.



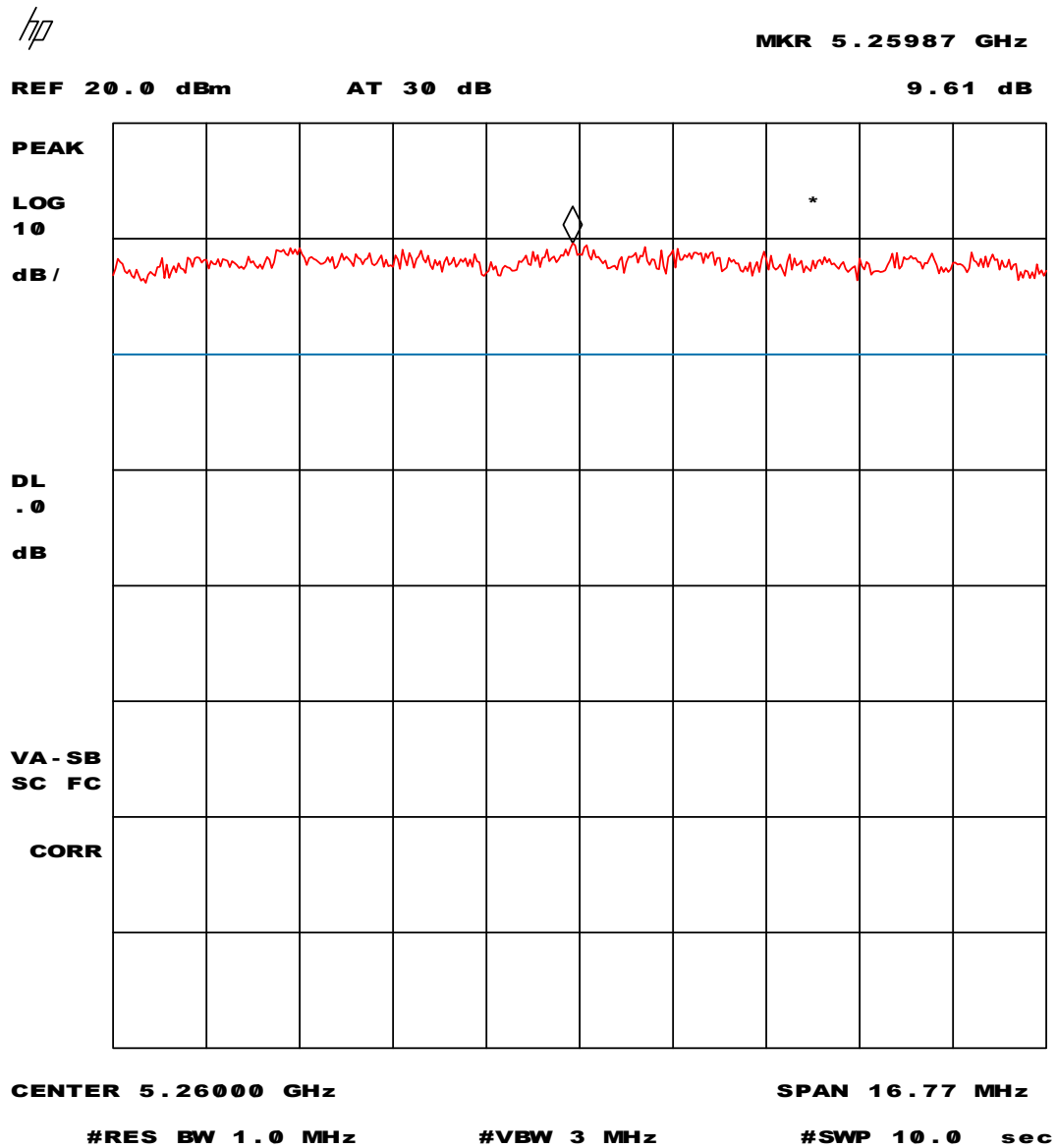
Plot 31 - Ratio of the peak excursion of the modulation envelope.

Plot 31 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 6 Mbit/s.



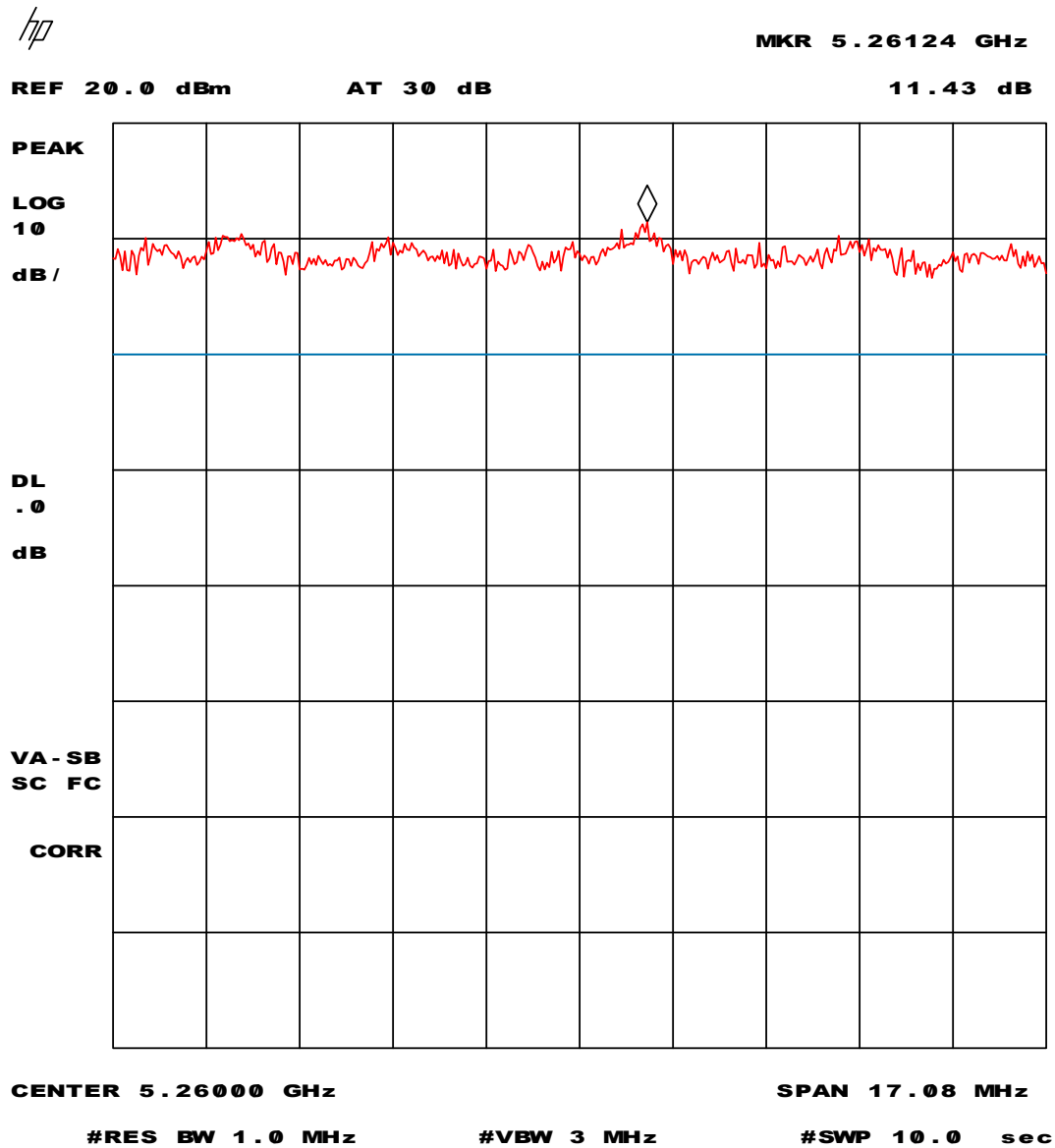
Plot 32 - Ratio of the peak excursion of the modulation envelope.

Plot 32 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 9 Mbit/s.



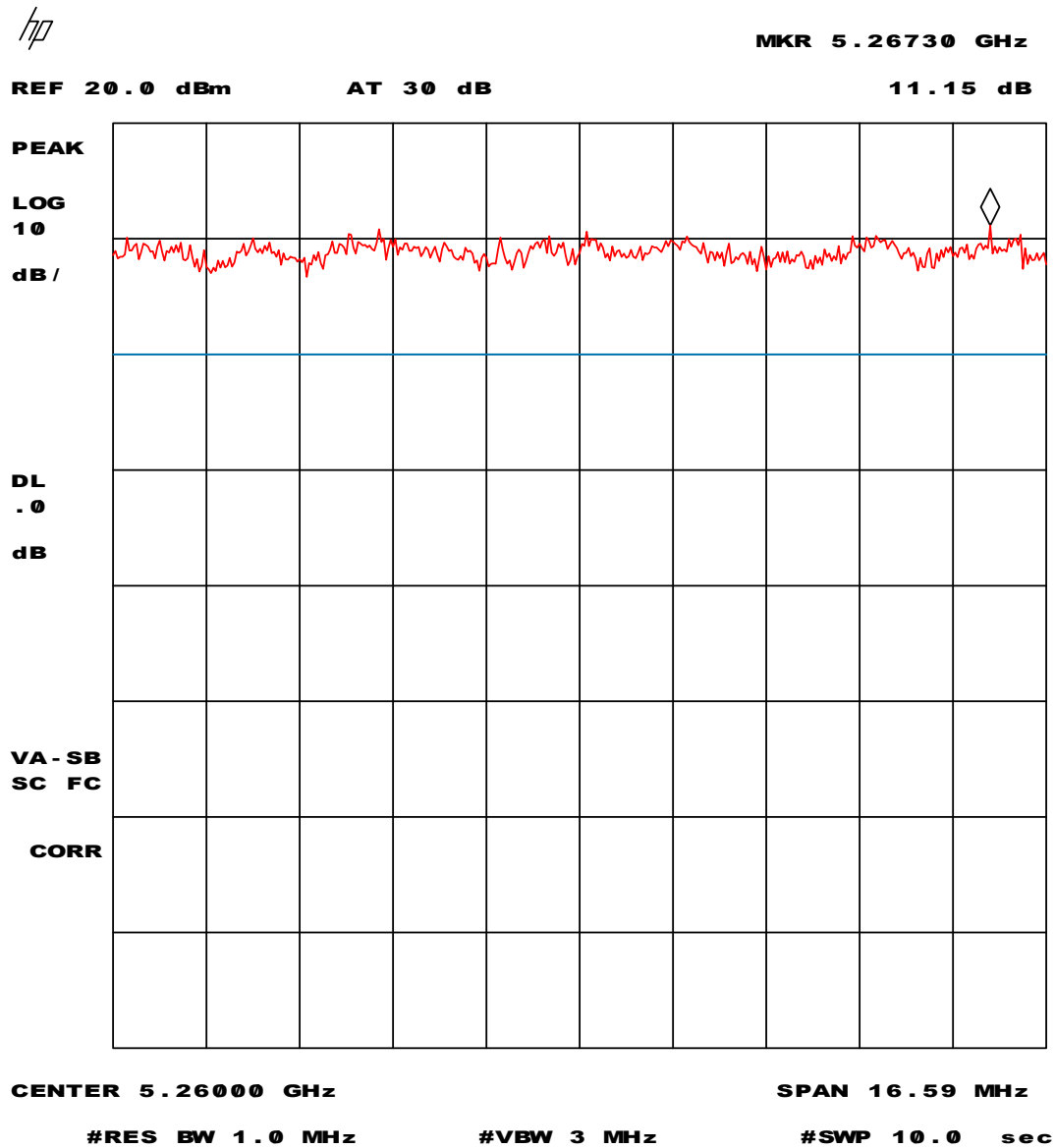
Plot 33 - Ratio of the peak excursion of the modulation envelope.

Plot 33 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 18 Mbit/s.



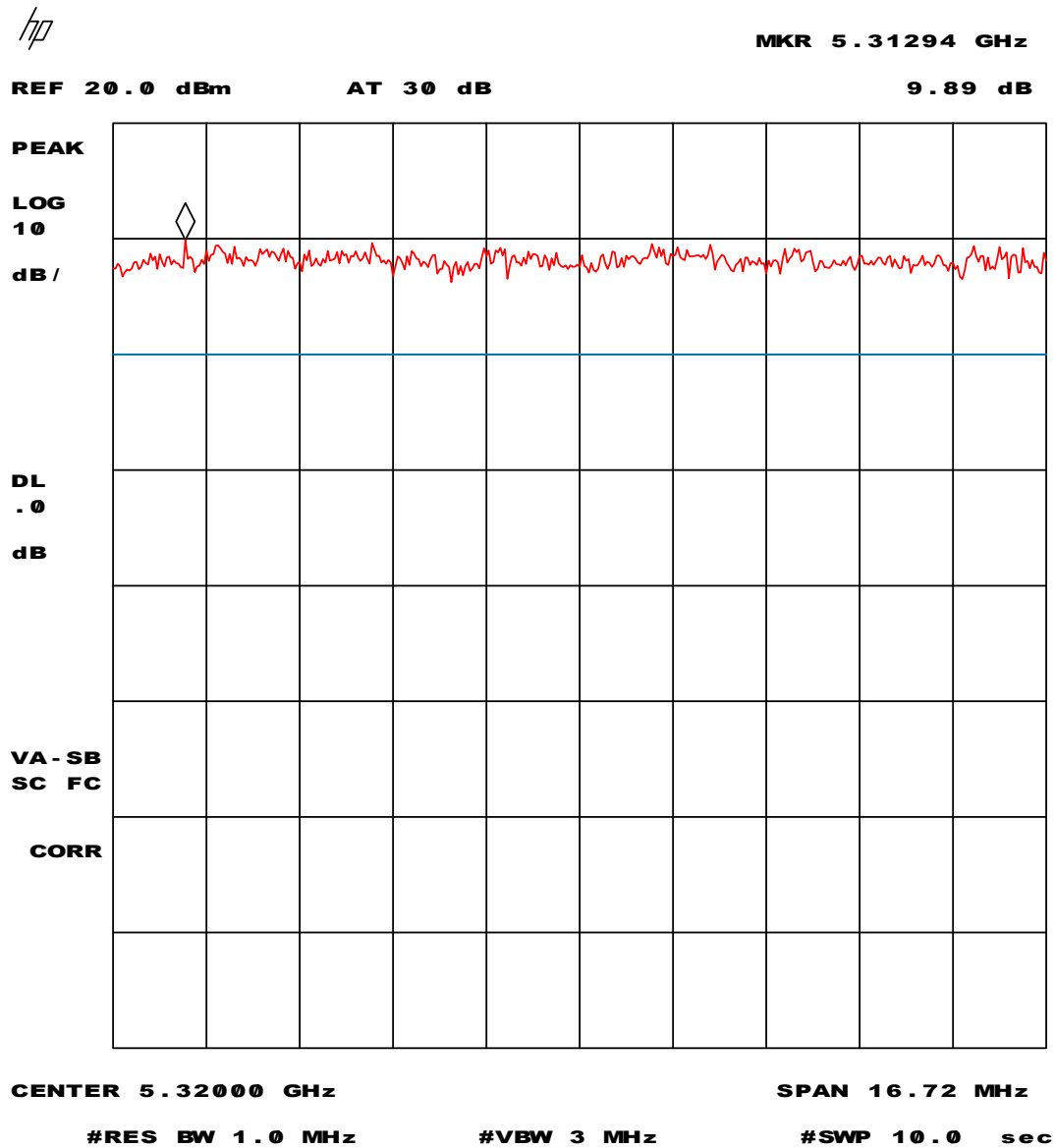
Plot 34 - Ratio of the peak excursion of the modulation envelope.

Plot 34 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 36 Mbit/s.



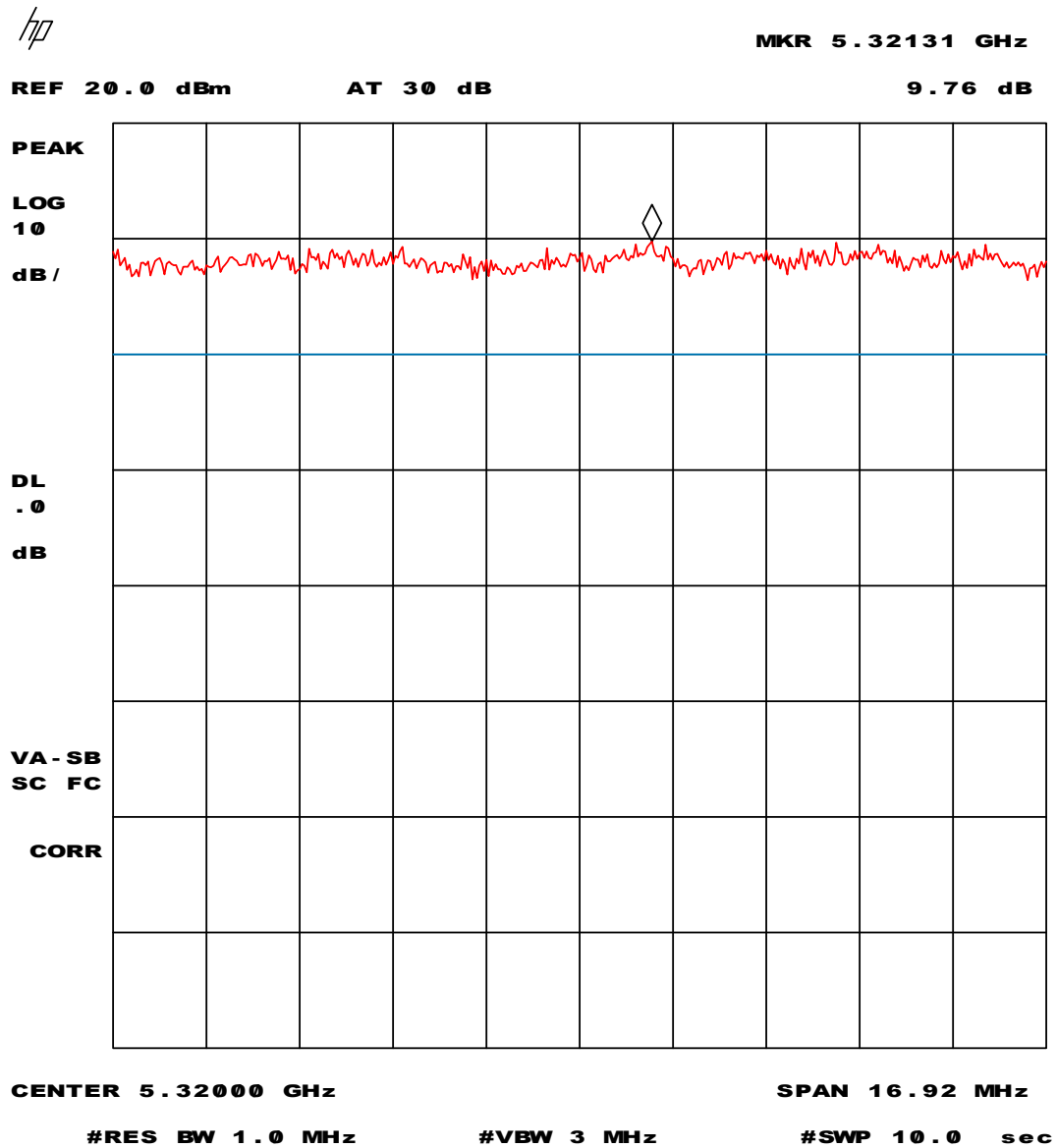
Plot 35 - Ratio of the peak excursion of the modulation envelope.

Plot 35 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 52 (5260 MHz) and at a transmission bit-rate of 54 Mbit/s.



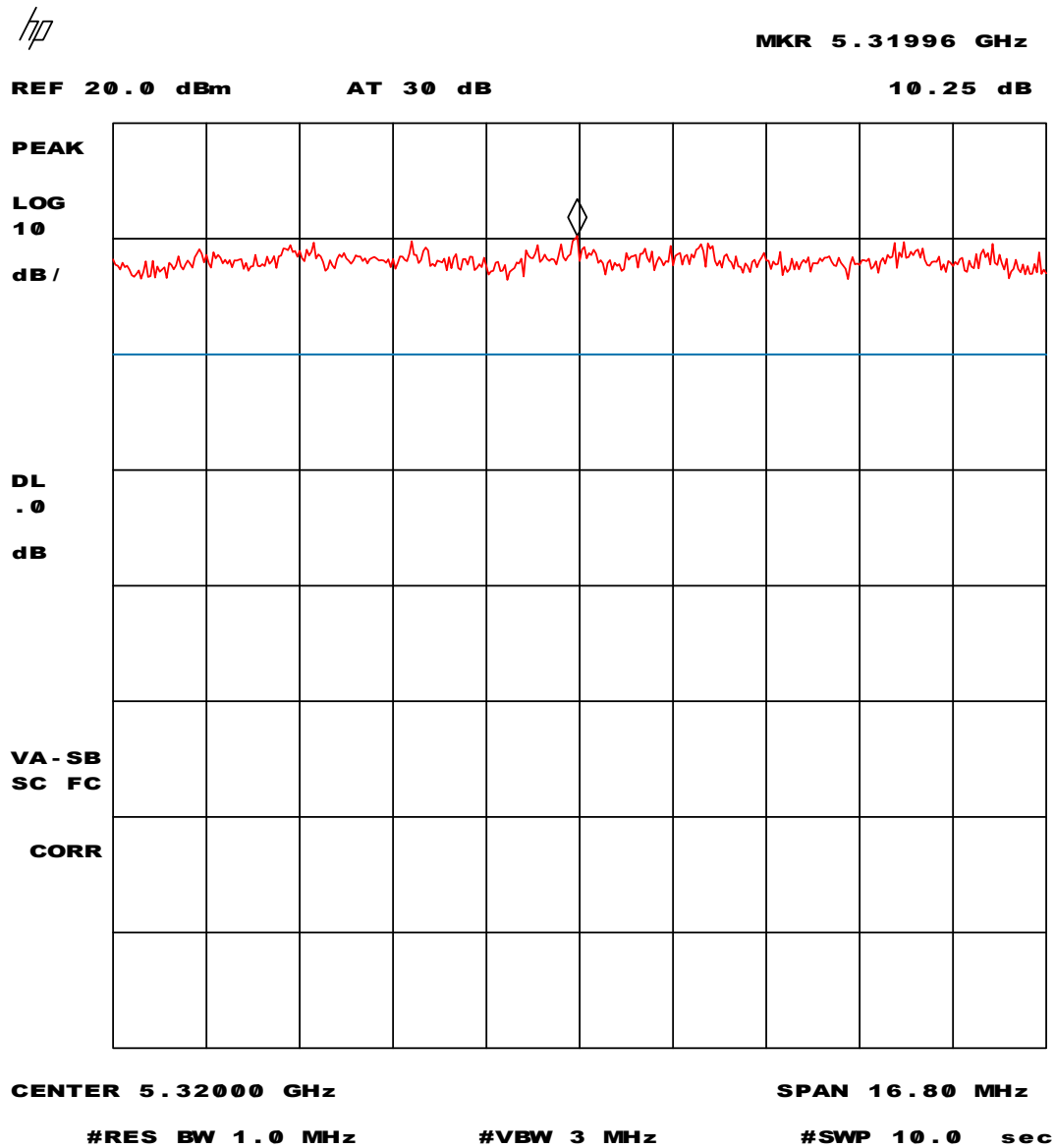
Plot 36 - Ratio of the peak excursion of the modulation envelope.

Plot 36 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 6 Mbit/s.



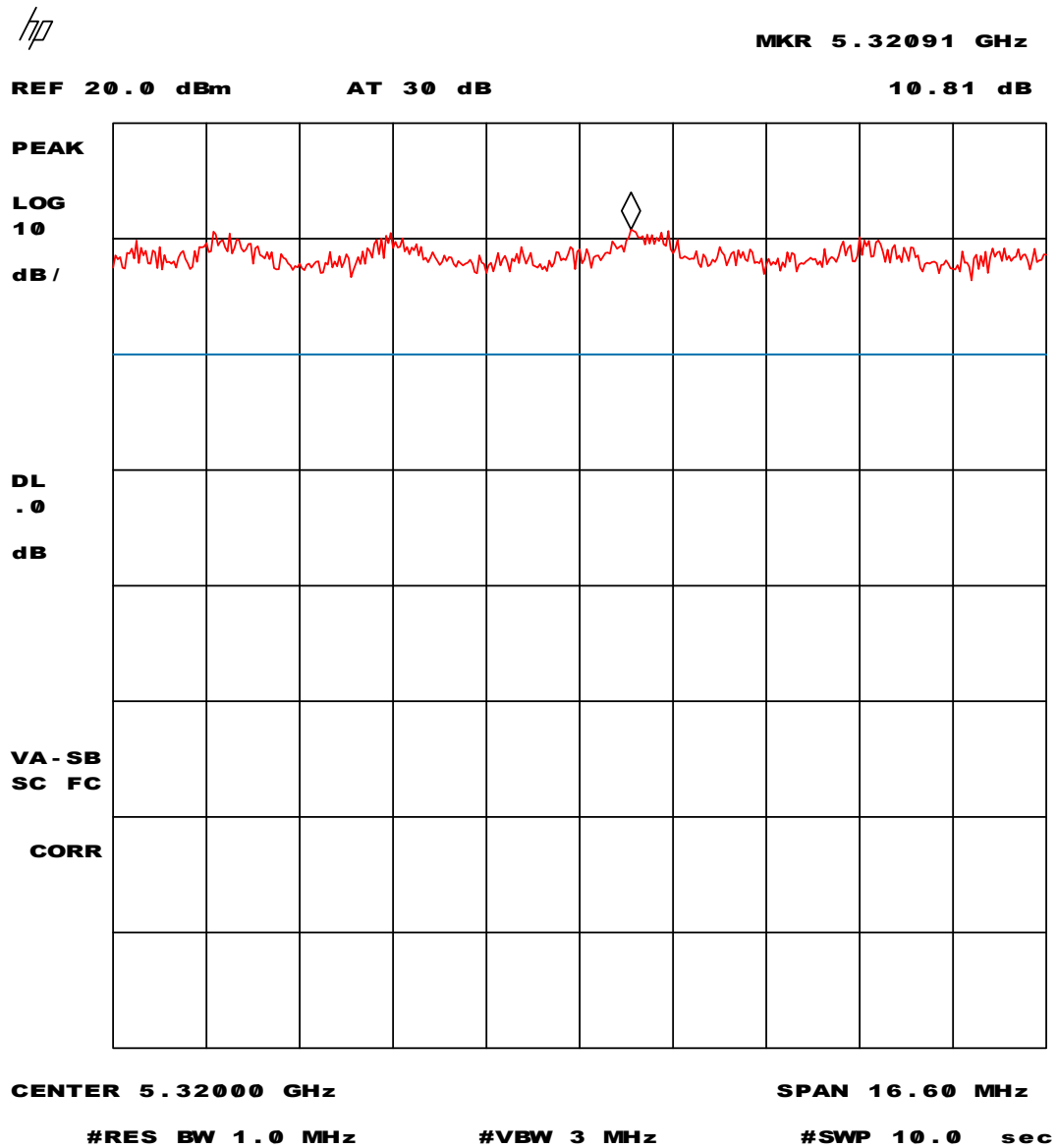
Plot 37 - Ratio of the peak excursion of the modulation envelope.

Plot 37 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 9 Mbit/s.



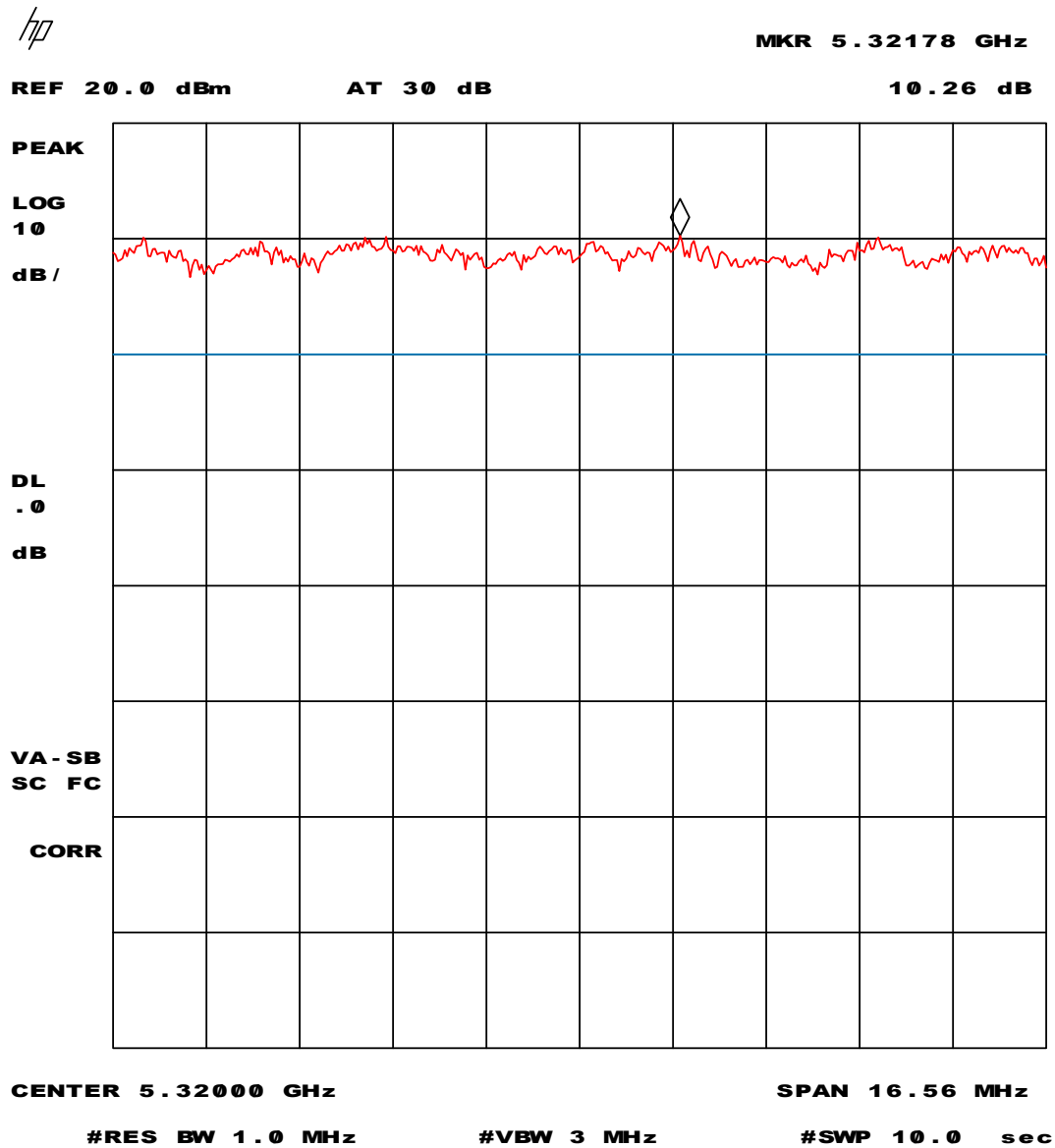
Plot 38 - Ratio of the peak excursion of the modulation envelope.

Plot 38 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 18 Mbit/s.



Plot 39 - Ratio of the peak excursion of the modulation envelope.

Plot 39 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 36 Mbit/s.

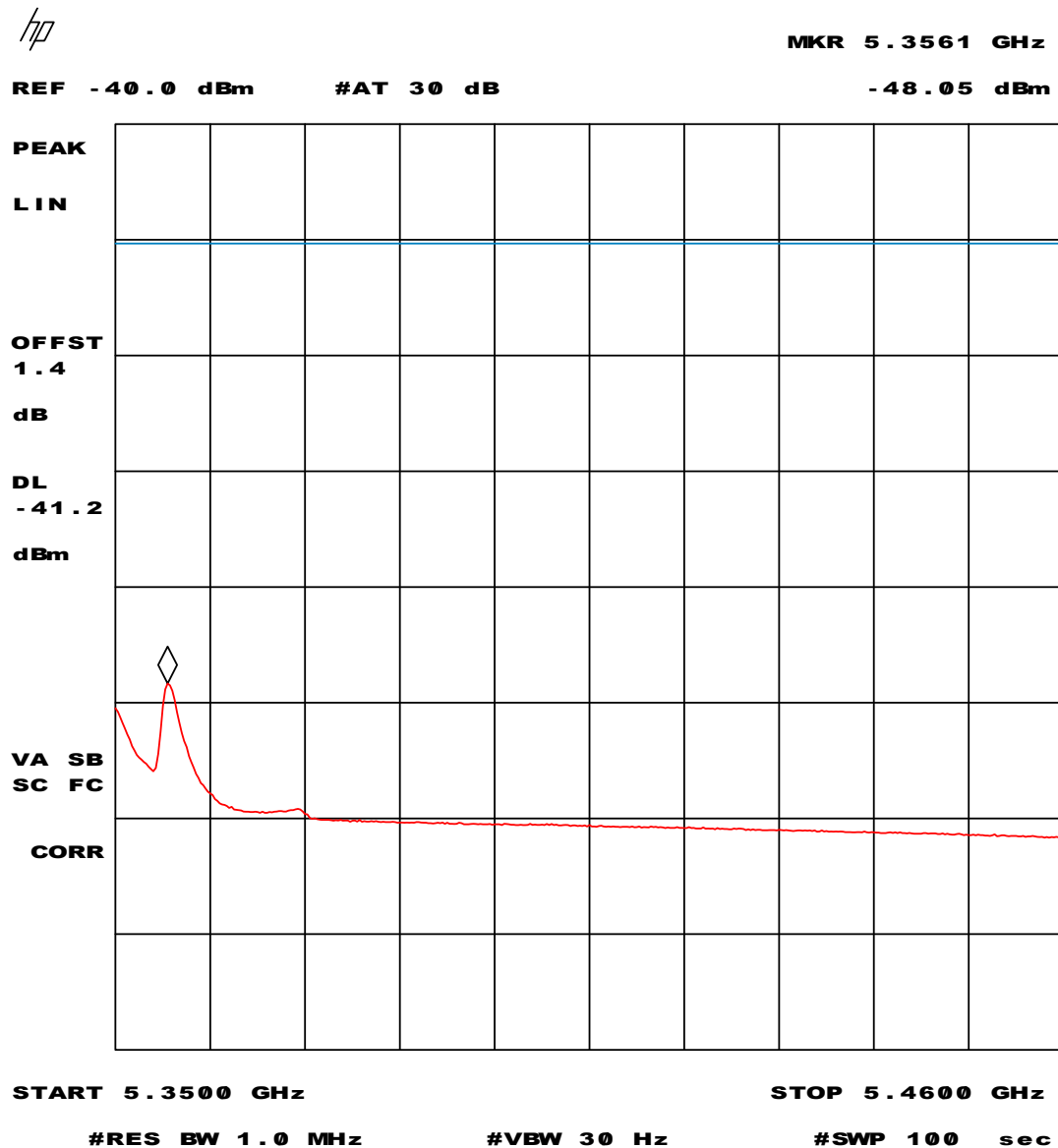


Plot 40 - Ratio of the peak excursion of the modulation envelope.

Plot 40 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 54 Mbit/s.



5.5 Emission in restricted bands nearest to the band 5.25 – 5.35 GHz.



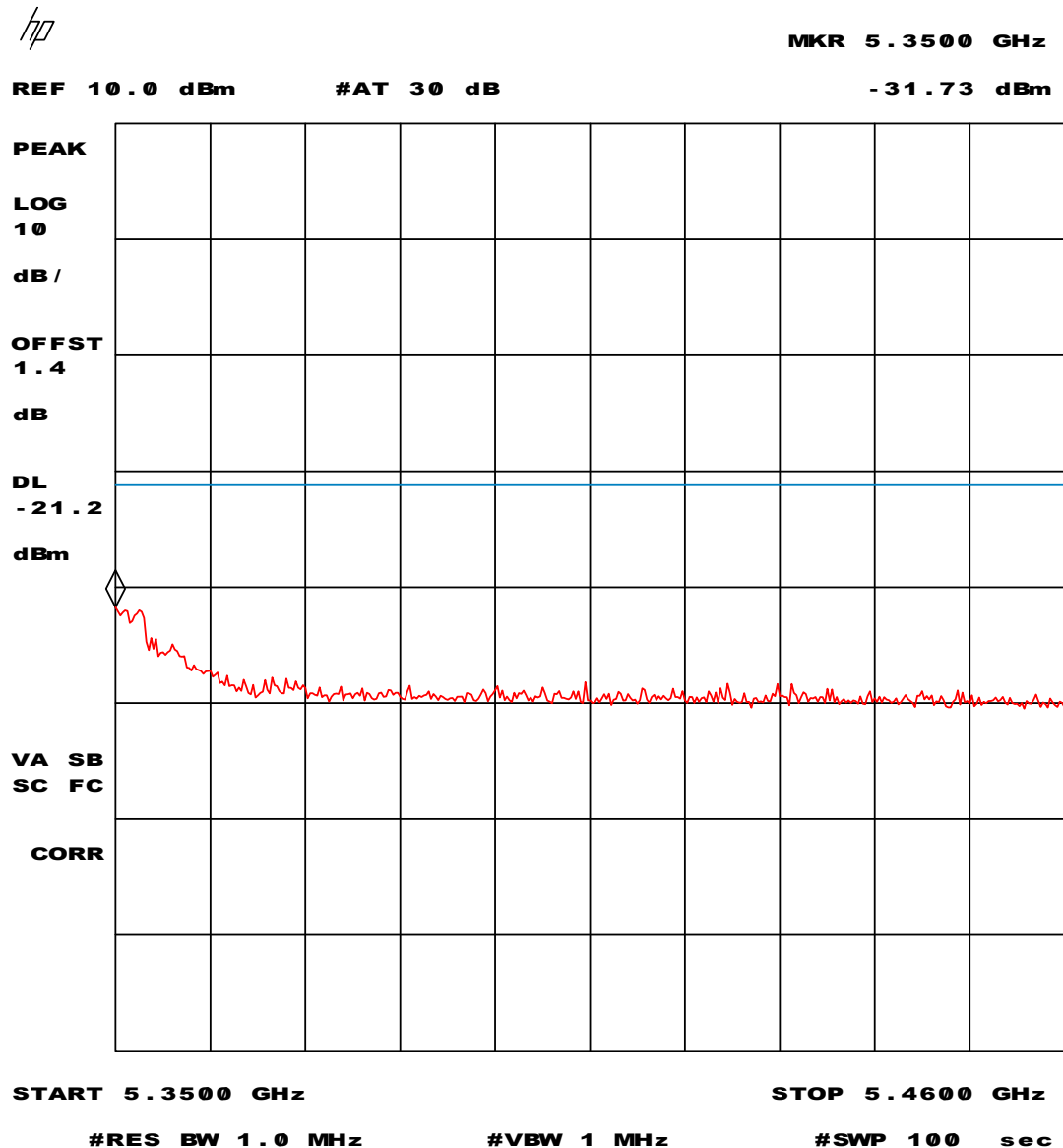
Plot 41 - Average measurement values in the 5.35 – 5.46 GHz restricted band of operation

Plot 41 depicts the average measurement values in the restricted band nearest to 5.25 – 5.35 GHz. All possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s), conducted measurement, corrected for 0.8 dBi antenna gain (including antenna cable losses) and 0.6 dB measurement cable losses.

Note: 54 dB μ V/m :: -41.2 dBm display line setting.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U



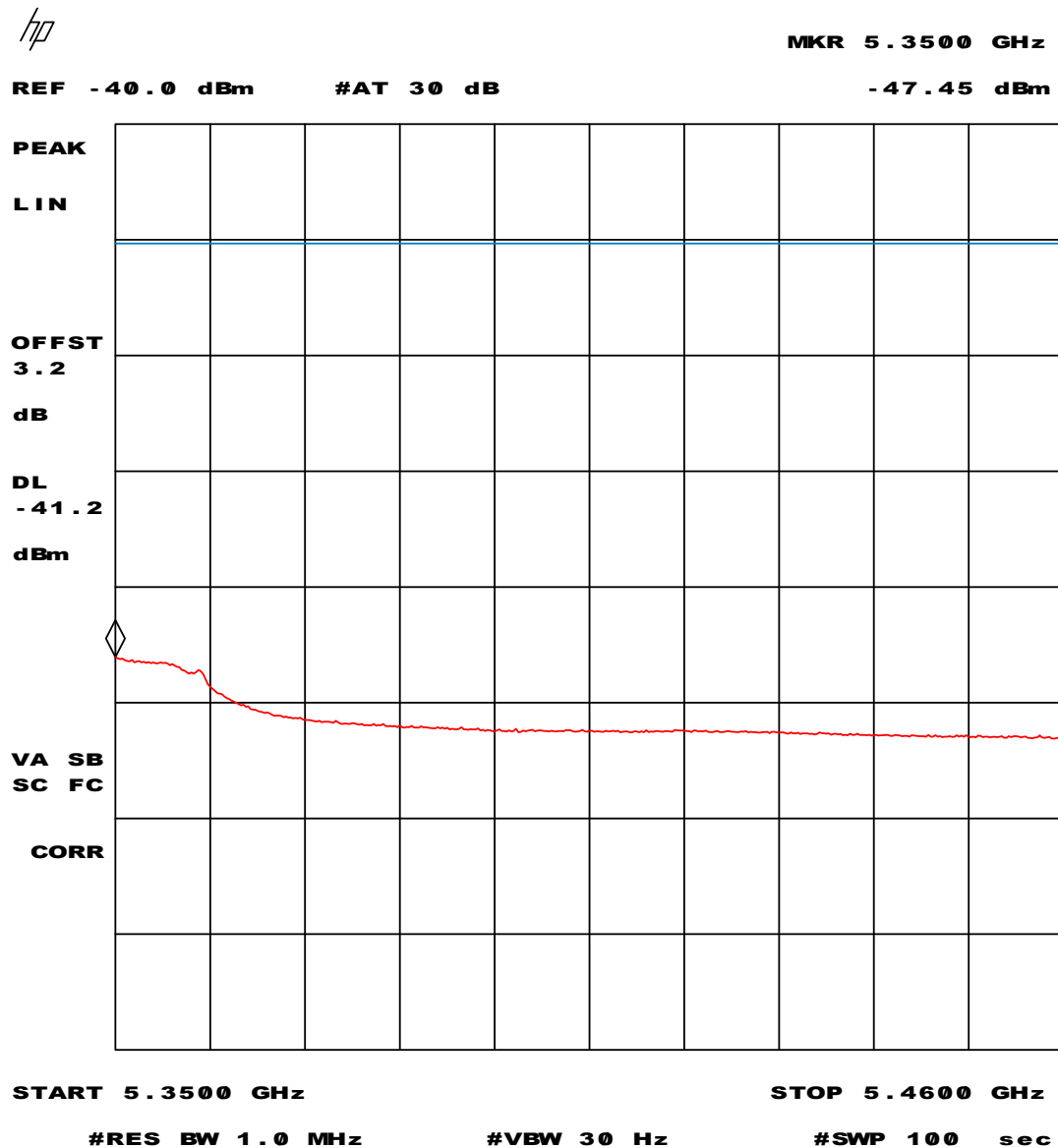
Plot 42 - Peak measurement values in the 5.35 – 5.46 GHz restricted band of operation

Plot 42 depicts the peak measurement values in the restricted band nearest to 5.25 – 5.35 GHz. All possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s), conducted measurement, corrected for 0.8 dBi antenna gain (including antenna cable losses) and 0.6 dB measurement cable losses.

Note: 74 dB μ V/m :: -21.2 dBm display line setting.



5.6 Emission in restricted bands nearest to the band 5.25 – 5.35 GHz (extreme test conditions).



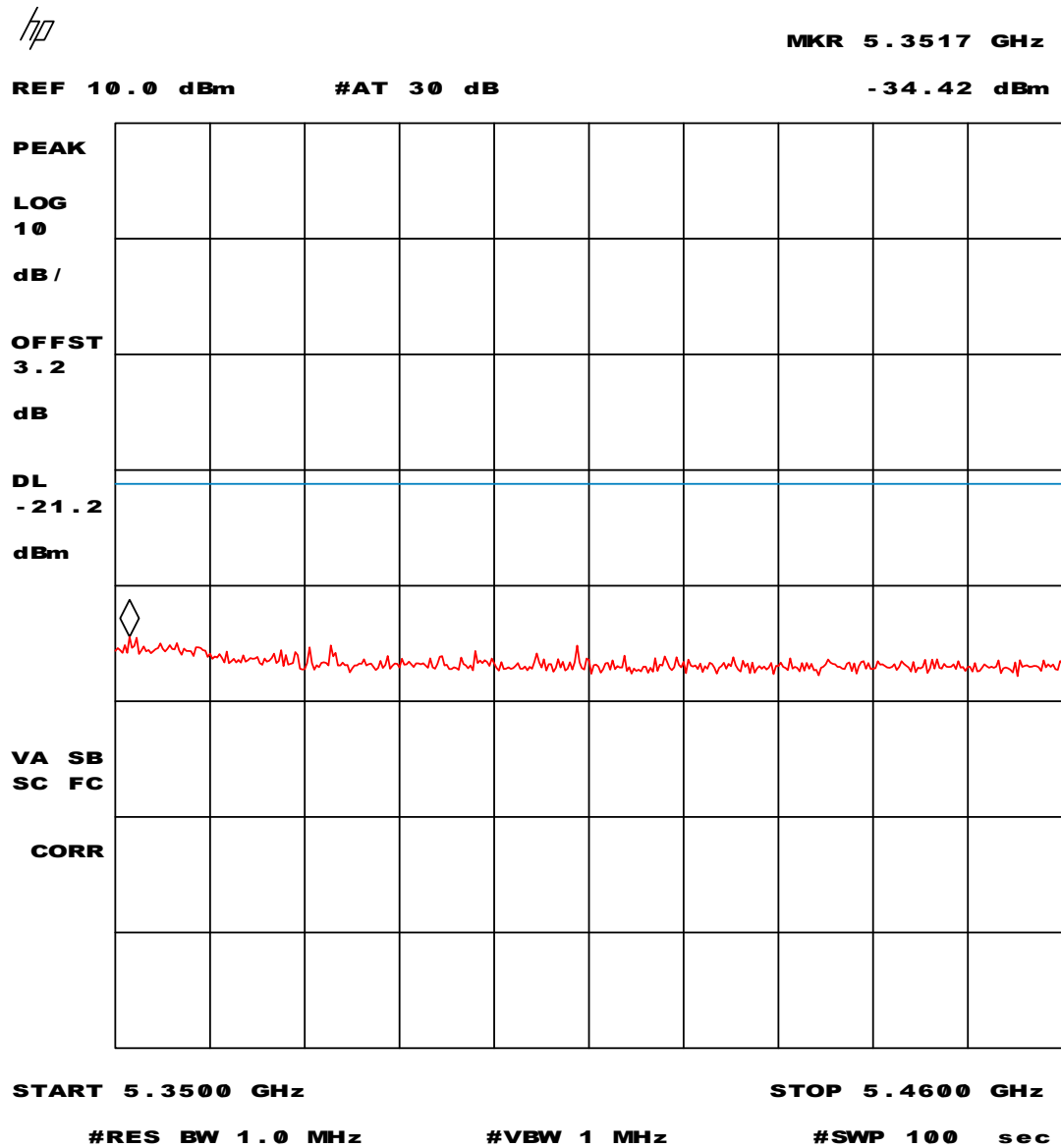
Plot 43 - Average measurement values in the 5.35 – 5.46 GHz restricted band of operation at -20 °C

Plot 43 depicts the average measurement values in the restricted band nearest to 5.25 – 5.35 GHz with the EUT at an ambient temperature of -20 °C. All possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s), conducted measurement, corrected for 0.8 dBi antenna gain (including antenna cable losses) and 2.4 dB measurement cable losses.

Note: 54 dBμV/m :: -41.2 dBm display line setting.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U



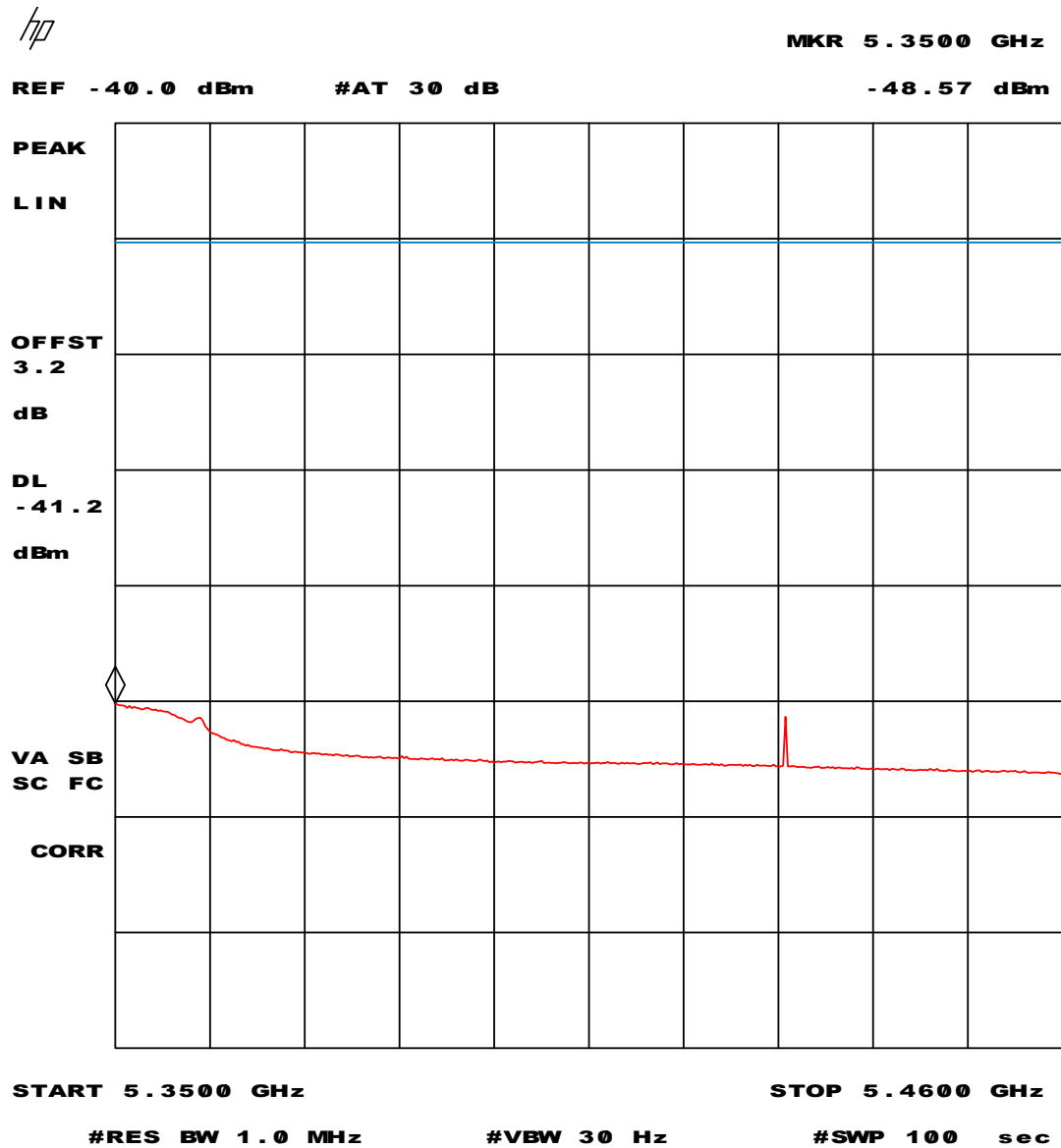
Plot 44 - Peak measurement values in the 5.35 – 5.46 GHz restricted band of operation at -20 °C

Plot 44 depicts the peak measurement values in the restricted band nearest to 5.25 – 5.35 GHz with the EUT at an ambient temperature of -20 °C. All possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s), conducted measurement, corrected for 0.8 dBi antenna gain (including antenna cable losses) and 2.4 dB measurement cable losses.

Note: 74 dBμV/m :: -21.2 dBm display line setting.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U



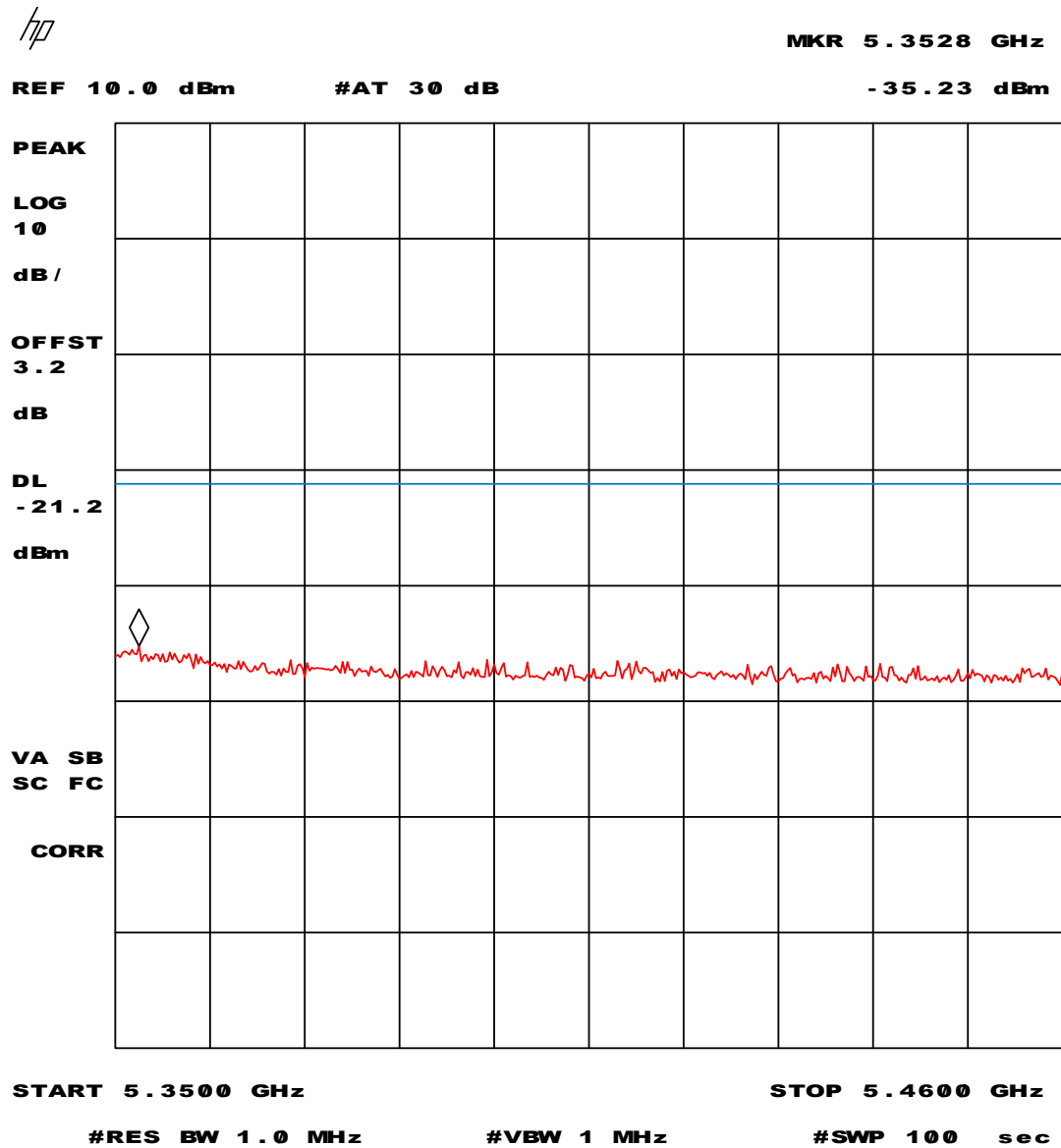
Plot 45 - Average measurement values in the 5.35 – 5.46 GHz restricted band of operation at 0 °C

Plot 45 depicts the average measurement values in the restricted band nearest to 5.25 – 5.35 GHz with the EUT at an ambient temperature of 0 °C. All possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s), conducted measurement, corrected for 0.8 dBi antenna gain (including antenna cable losses) and 2.4 dB measurement cable losses.

Note: 54 dB μ V/m :: -41.2 dBm display line setting.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U



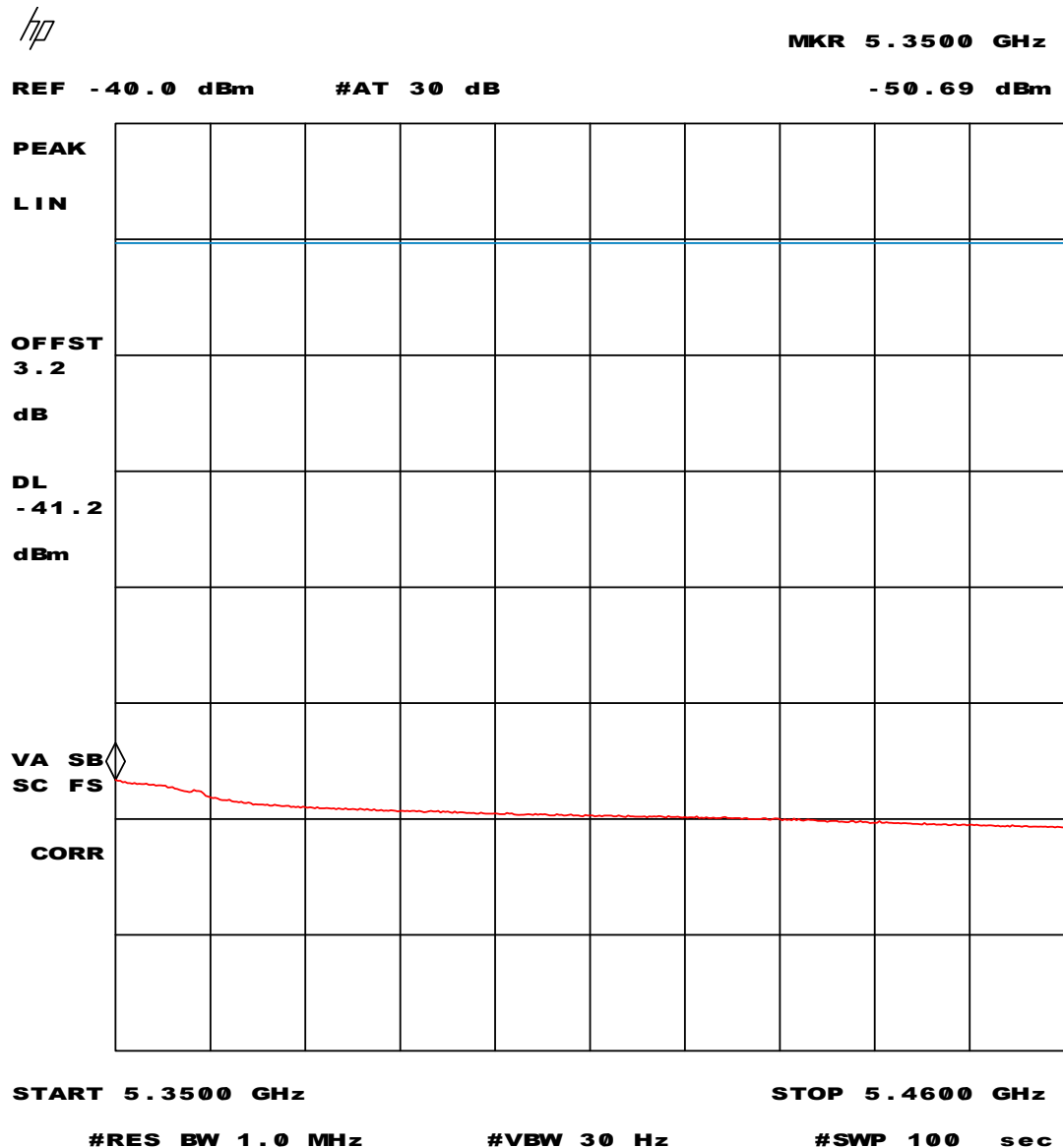
Plot 46 - Peak measurement values in the 5.35 – 5.46 GHz restricted band of operation at 0 °C

Plot 46 depicts the peak measurement values in the restricted band nearest to 5.25 – 5.35 GHz with the EUT at an ambient temperature of 0 °C. All possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s), conducted measurement, corrected for 0.8 dBi antenna gain (including antenna cable losses) and 2.4 dB measurement cable losses.

Note: 74 dB μ V/m :: -21.2 dBm display line setting.



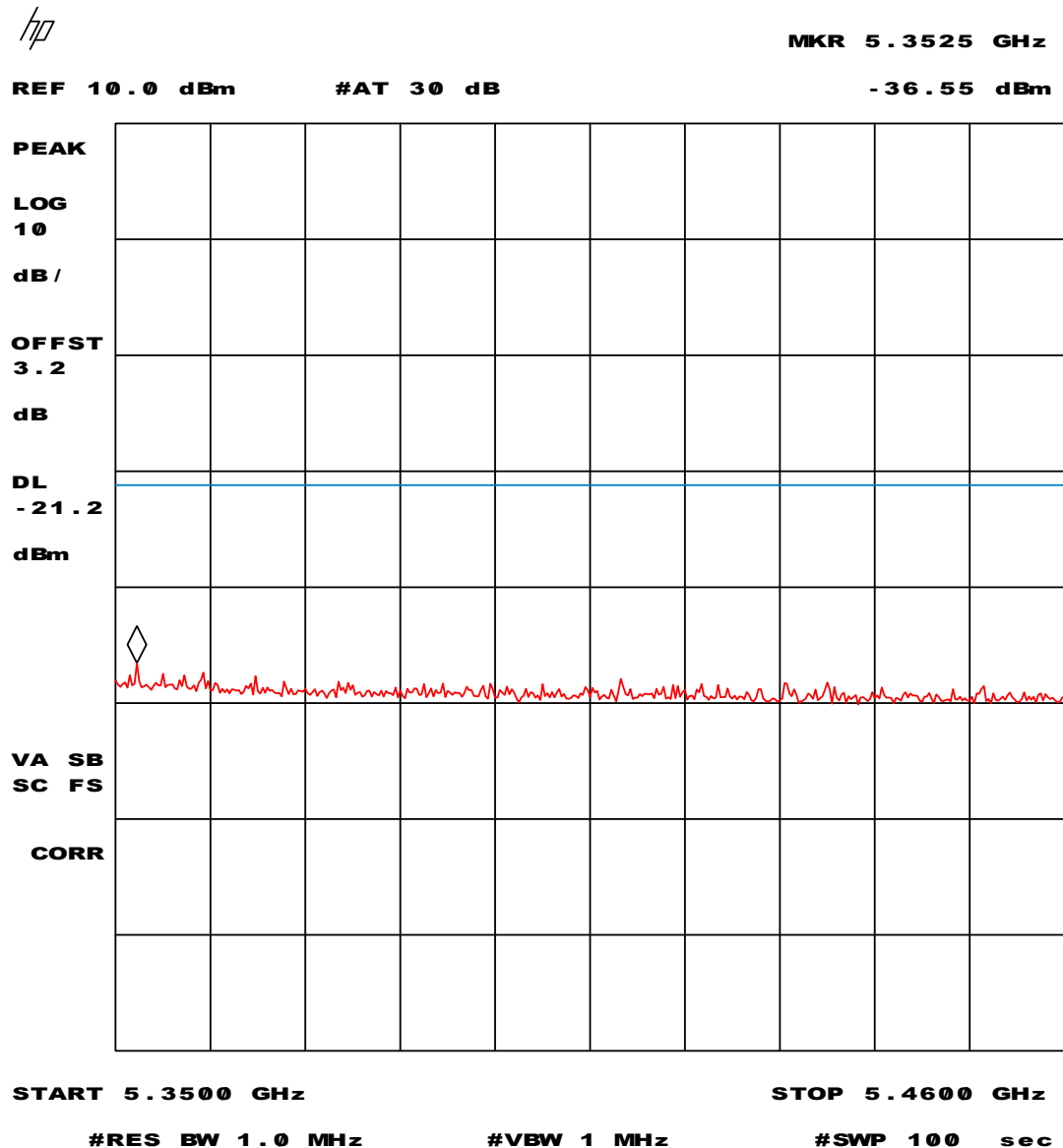
Test specification(s): 47 CFR Part 15 (December 8, 2003)
Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
Manufacturer: Gemtek Technology
Brand mark: Dell
Model: D1450U
FCC ID: RGS9207U



Plot 47 - Average measurement values in the 5.35 – 5.46 GHz restricted band of operation at +35 °C

Plot 47 depicts the average measurement values in the restricted band nearest to 5.25 – 5.35 GHz with the EUT at an ambient temperature of +35 °C. All possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s), conducted measurement, corrected for 0.8 dBi antenna gain (including antenna cable losses) and 2.4 dB measurement cable losses.

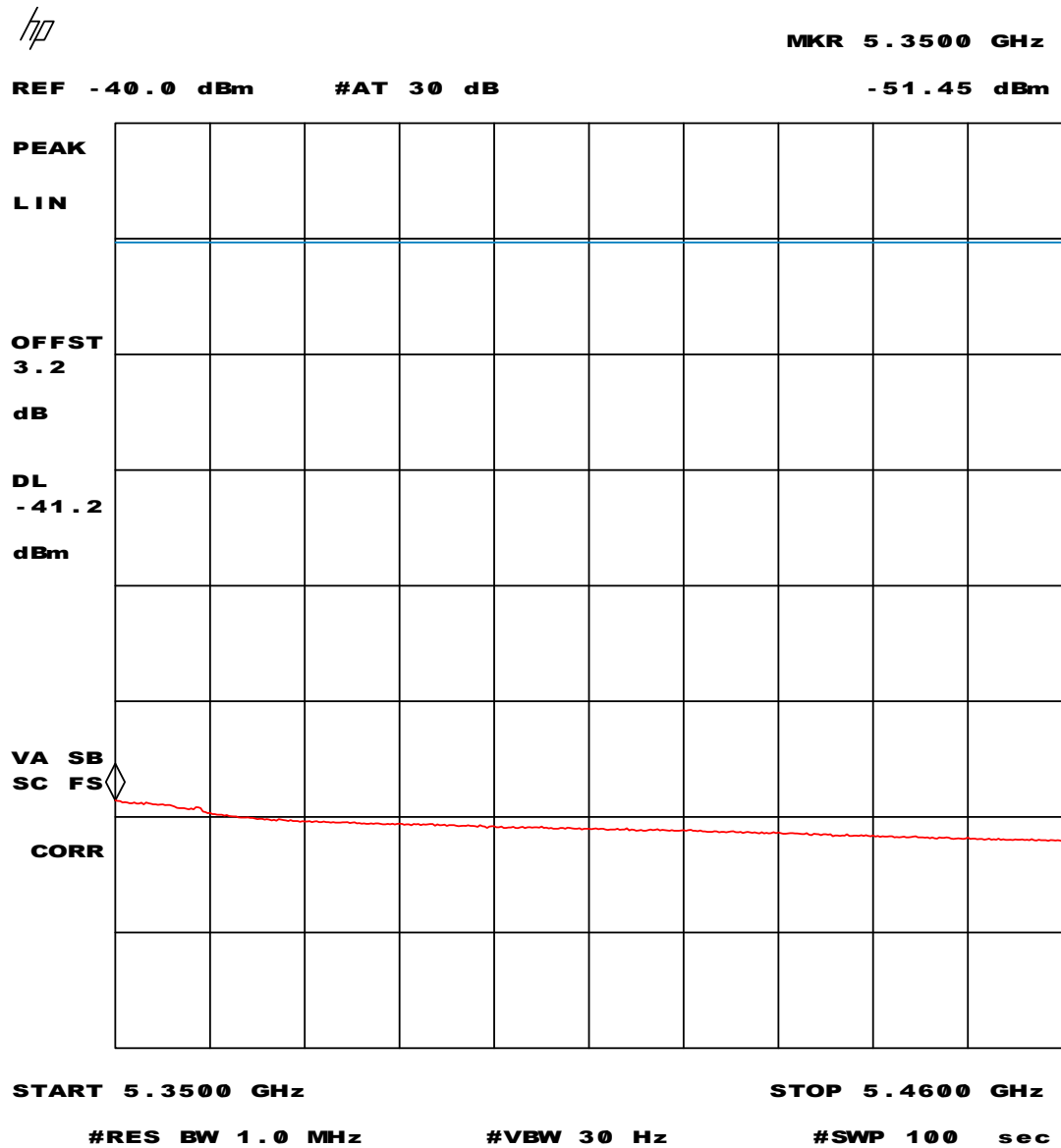
Note: 54 dB μ V/m :: -41.2 dBm display line setting.



Plot 48 - Peak measurement values in the 5.35 – 5.46 GHz restricted band of operation at +35 °C

Plot 48 depicts the peak measurement values in the restricted band nearest to 5.25 – 5.35 GHz with the EUT at an ambient temperature of +35 °C. All possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s), conducted measurement, corrected for 0.8 dBi antenna gain (including antenna cable losses) and 2.4 dB measurement cable losses.

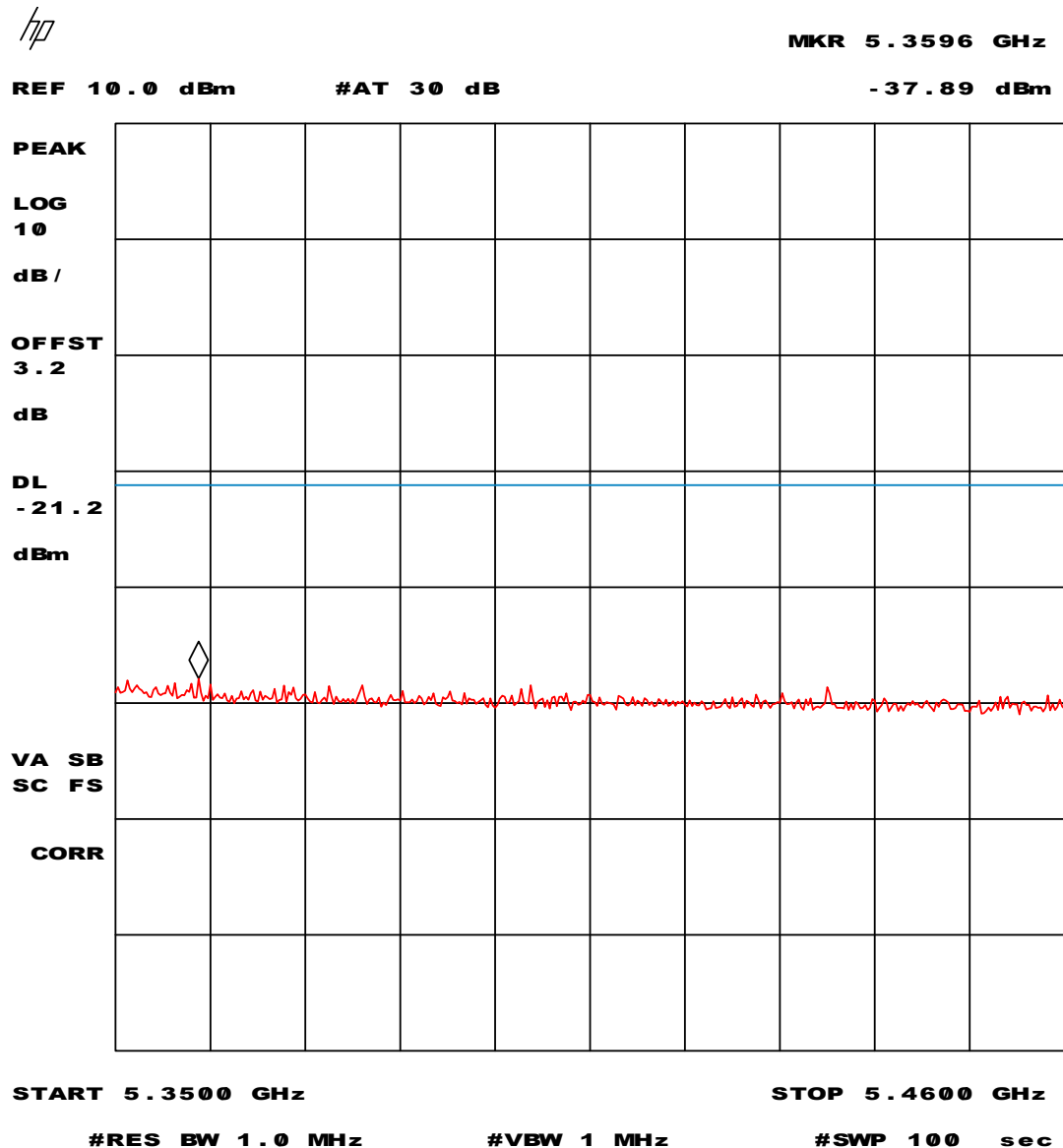
Note: 74 dB μ V/m :: -21.2 dBm display line setting.



Plot 49 - Average measurement values in the 5.35 – 5.46 GHz restricted band of operation at +50 °C

Plot 49 depicts the average measurement values in the restricted band nearest to 5.25 – 5.35 GHz with the EUT at an ambient temperature of +50 °C. All possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s), conducted measurement, corrected for 0.8 dBi antenna gain (including antenna cable losses) and 2.4 dB measurement cable losses.

Note: 54 dB μ V/m :: -41.2 dBm display line setting.



Plot 50 - Peak measurement values in the 5.35 – 5.46 GHz restricted band of operation at +50 °C

Plot 50 depicts the peak measurement values in the restricted band nearest to 5.25 – 5.35 GHz with the EUT at an ambient temperature of +50 °C. All possible transmission bit-rates (6/9 Mbit/s, 12/18 Mbit/s, 24/36 Mbit/s and 48/54 Mbit/s), conducted measurement, corrected for 0.8 dBi antenna gain (including antenna cable losses) and 2.4 dB measurement cable losses.

Note: 74 dB μ V/m :: -21.2 dBm display line setting.



Test specification(s): 47 CFR Part 15 (December 8, 2003)
 Description of EUT: Dell Wireless 1450 dual-band USB 2.0 adaptor
 Manufacturer: Gemtek Technology
 Brand mark: Dell
 Model: D1450U
 FCC ID: RGS9207U

6 List of utilized test equipment.

Inventory number	Description	Brand	Model
12471	Biconical antenna 20MHz-200MHz	EATON	94455-1
12473	Log-per antenna 200-1000MHz	EATON	96005
12476	Antenna mast	EMCO	TR3
12477	Antenna mast 1-4 mtr	Poelstra	--
12482	Loop antenna	EMCO	6507
12483	Guidehorn	EMCO	3115
12484	Guidehorn	EMCO	3115
12486	Guidehorn 18 – 40 GHz	EMCO	3116
12488	Guidehorn 18 - 26.5 GHz	EMCO	RA42-K-F-4B-C
12533	Signalgenerator	MARCONI	2032
12559	Digital storage oscilloscope	Le Croy	9310M
12561	DC Power Supply 20A/70V	DELTA	SM7020D
12567	Plotter	HP	7440A
12605	calibrated dipole 28MHz-1GHz	Emco	3121c
12608	HF milliwattmeter	Hewlett Packard	HP435a
12609	Power sensor 10MHz-18GHz	Hewlett Packard	HP8481A
12636	Polyester chamber	Polyforce	--
12640	Temperature chamber	Heraeus	VEM03/500
13664	Spectrum analyzer	HP	HP8593E
13078	Preamplifier 0.1 GHz - 12 GHz	Miteq	AMF-3D-001120-35-14p
13452	Digital multi meter	HP	34401A
13526	Signalgenerator 20 GHz	Hewlett & Packard	83620A
13594	Preamplifier 10 GHz - 25 GHz	Miteq	AMF-6D-100250-10p
13886	Open Area testsite	Comtest	--
14051	Anechoic room	Comtest	--
14450	2.4 GHz bandrejectfilter	BSC	XN-1783
15633	Biconilog Testantenna	Chase	CBL 6111B
15667	Measuring receiver	R&S	ESCS 30
99045	DC Power Supply 3A/30V	DELTA	E030/3
99055	Non-conducting support	NMi	--
99061	Non-conducting support 150cm	NMi	--
99068	Detector N-F/BNC-F	Radiall	R451576000
99069	Cable 5m RG214	NMi	--
99071	Cable 10m RG214	NMi	--
99076	Bandpassfilter 4 - 10 GHz	Reactel	7AS-7G-6G-511
99077	Regulating trafo	RFT	LTS006
99112	Tripod	Chase	--
99136	Bandpassfilter 10 - 26.5 GHz	Reactel	9HS-10G/26.5G-S11
99199	Spectrum Analyzer	R&S	FSP40