



**TEST REPORT OF A 2.4/5 GHZ IEEE 802.11g/a WLAN  
CARDBUS CARD, BRAND AGERE, MODEL 1102, IN  
CONFORMITY WITH 47 CFR PART 15 (July 22, 2003).**

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

**TNO Electronic Products & Services (EPS) B.V.**  
**P.O. Box 15**  
**9822 ZG Niekerk (NL)**  
**Smidshornerweg 18**  
**9822 TL Niekerk (NL)**

Telephone: +31 594 505005  
Telefax: +31 594 504804

E-mail: [info@eps.tno.nl](mailto:info@eps.tno.nl)  
Web: [www.eps.tno.nl](http://www.eps.tno.nl)



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

## MEASUREMENT/TECHNICAL REPORT

**Agere Systems Nederland B.V.**

**Model : 1102**

**FCC ID: IMR1102CB**

March 3, 2004

|                                                       |                              |                                                 |                         |
|-------------------------------------------------------|------------------------------|-------------------------------------------------|-------------------------|
| This report concerns:                                 | Original grant/certification | <del>Class 2 change</del>                       | <del>Verification</del> |
| Equipment type:                                       | Unlicensed U-NII Device      |                                                 |                         |
| Deferred grant requested per 47 CFR 0.457(d)(1)(ii) ? |                              | <del>Yes</del>                                  | No                      |
| Report prepared by:                                   | Name                         | : P.A.J.M. Robben, B.Sc.E.E.                    |                         |
|                                                       | Company name                 | : TNO Electronic Products & Services (EPS) B.V. |                         |
|                                                       | Address                      | : Smidshornerweg 18                             |                         |
|                                                       | Postal code/city             | : 9822 ZG Niekerk                               |                         |
|                                                       | Mailing address              | : P.O. Box 15                                   |                         |
|                                                       | Postal code/city             | : 9822 TL Niekerk                               |                         |
|                                                       | Country                      | : The Netherlands                               |                         |
|                                                       | Telephone number             | : + 31 594 505 005                              |                         |
|                                                       | Telefax number               | : + 31 594 504 804                              |                         |
|                                                       | E-mail                       | : info@eps.tno.nl                               |                         |

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: March 3, 2004

Signature:

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



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### **Description of test item**

Test item : 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer : Agere Systems Nederland B.V.  
Brand : Agere  
Model : 1102  
Serial numbers : 04NG07900050 and 04NG07900057  
Revision : C model  
Receipt number : 2  
Receipt date : February 16, 2004

### **Applicant information**

Applicant's representative : Mr. W. Kerkhof  
Company : Agere Systems Nederland B.V.  
Address : Zadelstede 1-10  
Postal code : 3431 JZ  
City : Nieuwegein  
PO-box : 755  
Postal code : 3430 AT  
City : Nieuwegein  
Country : The Netherlands  
Telephone number : +31 30 609 7534  
Telefax number : +31 30 609 7556

### **Test(s) performed**

Location : Niekirk  
Test(s) started : February 16, 2004  
Test(s) completed : February 26, 2004  
Purpose of test(s) : Type approval / certification  
Test specification(s) : 47 CFR Part 15 (July 22, 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 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

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## 1 General information.

### 1.1 Product description.

The 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card, brand Agere, model 1102, is designed to operate in the 5 GHz unlicensed U-NII devices frequency band (5.15 GHz – 5.35 GHz), as specified by the Federal Communications Commission in the USA. The equipment version marketed in the USA is limited to operation in the frequency band of 5.15 GHz – 5.35 GHz.

The 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card, brand Agere, model 1102, utilizes Direct Sequence Spread Spectrum (DSSS) and OFDM modulation techniques.

The 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card, brand Agere, model 1102, 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                                                                                                     |
|----------------------------------------------------------------------|-------------------------|-------------------------------|------------|------------------------------------------------------------------------------------------------------------------------|
| 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card                           | 1102                    | 04NG07900050 and 04NG07900057 | IMR1102CB  | None.                                                                                                                  |
| Dell notebook computer                                               | C600                    | 4R4950J                       | n.a. (DoC) | -Unshielded DC power cord to AC/DC adapter;<br>-Shielded parallel cable to printer;<br>-Shielded mouse cable to mouse. |
| Dell AC/DC power adapter<br>100-240 VAC/1.5 Amps to +20 VDC/3.5 Amps | AA20031,<br>PA-6 family | CN-09364U-16291-13N-0AT2      | n.a. (DoC) | -Unshielded DC power cord to notebook computer;<br>-Unshielded power cord to AC mains.                                 |
| Hewlett-Packard Mouse                                                | C3751B                  | LZA73702141                   | n.a. (DoC) | -Shielded mouse cable to notebook computer.                                                                            |
| HP DeskJet 895Cxi                                                    | C6410A                  | ES8B42307H                    | n.a. (DoC) | -Unshielded DC power cord to AC/DC adapter;<br>-Shielded parallel cable to notebook computer.                          |
| HP AC/DC power adapter<br>100-240 VAC/1 Amps to +18 VDC/1.1 Amps     | C6409-60014             | n.a.                          | n.a. (DoC) | -Unshielded DC power cord to printer;<br>-Unshielded power cord to AC mains.                                           |

Table 1 - Tested system details overview.



|                               |                                                   |
|-------------------------------|---------------------------------------------------|
| <b>Test specification(s):</b> | <b>47 CFR Part 15 (July 22, 2003)</b>             |
| <b>Description of EUT:</b>    | <b>2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card</b> |
| <b>Manufacturer:</b>          | <b>Agere Systems Nederland B.V.</b>               |
| <b>Brand mark:</b>            | <b>Agere</b>                                      |
| <b>Model:</b>                 | <b>1102</b>                                       |
| <b>FCC ID:</b>                | <b>IMR1102CB</b>                                  |

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## 1.4 Test methodology.

The test methodology used is based on the requirements of 47 CFR Part 15 (July 22, 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 Cardbus slot of the host system by means of an “extender card” for the purpose of proving compliance with the applicable parts of 47 CFR Part 15 in case no additional shielding of the EUT is provided by the host system. The EUT was tested while using the integral antenna of the EUT.

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 36 (5180 MHz), channel 48 (5240 MHz), channel 52 (5260 MHz) and channel 64 (5320 MHz). Further details may be found in table 2 below.

| Channel | Operating frequencies (MHz) | Rated output power (mW) | Test performed |
|---------|-----------------------------|-------------------------|----------------|
| 36      | 5180                        | 11.8                    | yes            |
| 40      | 5200                        | 11.8                    | no             |
| 44      | 5220                        | 11.8                    | no             |
| 48      | 5240                        | 11.8                    | yes            |
| 52      | 5260                        | 12.4                    | yes            |
| 56      | 5280                        | 12.4                    | no             |
| 60      | 5300                        | 12.4                    | no             |
| 64      | 5320                        | 12.4                    | 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.



|                        |                                            |
|------------------------|--------------------------------------------|
| Test specification(s): | 47 CFR Part 15 (July 22, 2003)             |
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| Manufacturer:          | Agere Systems Nederland B.V.               |
| Brand mark:            | Agere                                      |
| Model:                 | 1102                                       |
| FCC ID:                | IMR1102CB                                  |

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### **1.7.2 EUT test software.**

The EUT could be enabled to transmit or receive continuously on channels 36 (5180 MHz), 48 (5240 MHz), 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.

### **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.



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## 2 Radiated emission data.

### 2.1 Test results with EUT operating in receive mode on channel 36.

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 36 (5180 MHz), are depicted in table 4.

| Frequency<br>(MHz) | Test results<br>quasi peak<br>(dB $\mu$ V/m) |      | Test results<br>average<br>(dB $\mu$ V/m) |      | Test results<br>peak<br>(dB $\mu$ V/m) |      | Resolution<br>bandwidth<br>(kHz) | Quasi peak<br>limits<br>(dB $\mu$ V/m) | Average<br>limits<br>(dB $\mu$ V/m) | Peak<br>limits<br>(dB $\mu$ V/m) |
|--------------------|----------------------------------------------|------|-------------------------------------------|------|----------------------------------------|------|----------------------------------|----------------------------------------|-------------------------------------|----------------------------------|
|                    | V                                            | H    | V                                         | H    | V                                      | H    |                                  |                                        |                                     |                                  |
| 78.44              | 20.5                                         | 15.8 | -                                         | -    | -                                      | -    | 120                              | 46.0                                   | -                                   | -                                |
| 165.09             | 19.8                                         | 12.8 | -                                         | -    | -                                      | -    | 120                              | 46.0                                   | -                                   | -                                |
| 166.52             | 25.3                                         | 26.2 | -                                         | -    | -                                      | -    | 120                              | 46.0                                   | -                                   | -                                |
| 166.67             | 25.9                                         | 28.2 | -                                         | -    | -                                      | -    | 120                              | 46.0                                   | -                                   | -                                |
| 167.06             | 24.5                                         | 29.1 | -                                         | -    | -                                      | -    | 120                              | 46.0                                   | -                                   | -                                |
| 167.91             | 25.1                                         | 31.0 | -                                         | -    | -                                      | -    | 120                              | 46.0                                   | -                                   | -                                |
| 168.21             | 20.1                                         | 23.0 | -                                         | -    | -                                      | -    | 120                              | 46.0                                   | -                                   | -                                |
| 484.00             | 26.4                                         | 23.9 | -                                         | -    | -                                      | -    | 120                              | 46.0                                   | -                                   | -                                |
| 6893.00            | -                                            | -    | n.t.                                      | n.t. | 44.3                                   | 44.7 | 1000                             | -                                      | 54.0                                | 74.0                             |
| 10350.00           | -                                            | -    | n.t.                                      | n.t. | 49.1                                   | 46.6 | 1000                             | -                                      | 54.0                                | 74.0                             |

Table 4 - Test results with the EUT operating in receive mode on channel 36 (5180 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 : H.J. Pieters

Date : February 16, 2004



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## 2.2 Test results with EUT operating in receive mode on channel 48.

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 48 (5240 MHz), are depicted in table 5.

| Frequency<br>(MHz) | Test results<br>quasi peak<br>(dBµV/m) |      | Test results<br>average<br>(dBµV/m) |      | Test results<br>peak<br>(dBµV/m) |      | Resolution<br>bandwidth<br>(kHz) | Quasi peak<br>limits<br>(dBµV/m) | Average<br>limits<br>(dBµV/m) | Peak<br>limits<br>(dBµV/m) |
|--------------------|----------------------------------------|------|-------------------------------------|------|----------------------------------|------|----------------------------------|----------------------------------|-------------------------------|----------------------------|
|                    | V                                      | H    | V                                   | H    | V                                | H    |                                  |                                  |                               |                            |
| 78.44              | 20.5                                   | 15.8 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 165.09             | 19.8                                   | 12.8 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 166.52             | 25.3                                   | 26.2 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 166.67             | 25.9                                   | 28.2 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 167.06             | 24.5                                   | 29.1 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 167.91             | 25.1                                   | 31.0 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 168.21             | 20.1                                   | 23.0 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 484.00             | 26.4                                   | 23.9 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 6973.00            | -                                      | -    | n.t.                                | n.t. | <40.0                            | 43.2 | 1000                             | -                                | 54.0                          | 74.0                       |
| 10460.00           | -                                      | -    | n.t.                                | n.t. | 49.1                             | 46.6 | 1000                             | -                                | 54.0                          | 74.0                       |

Table 5 - Test results with the EUT operating in receive mode on channel 48 (5240 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 : H.J. Pieters

Date : February 16, 2004



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### 2.3 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 6.

| Frequency<br>(MHz) | Test results<br>quasi peak<br>(dBµV/m) |      | Test results<br>average<br>(dBµV/m) |      | Test results<br>peak<br>(dBµV/m) |      | Resolution<br>bandwidth<br>(kHz) | Quasi peak<br>limits<br>(dBµV/m) | Average<br>limits<br>(dBµV/m) | Peak<br>limits<br>(dBµV/m) |
|--------------------|----------------------------------------|------|-------------------------------------|------|----------------------------------|------|----------------------------------|----------------------------------|-------------------------------|----------------------------|
|                    | V                                      | H    | V                                   | H    | V                                | H    |                                  |                                  |                               |                            |
| 78.44              | 20.5                                   | 15.8 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 165.09             | 19.8                                   | 12.8 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 166.52             | 25.3                                   | 26.2 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 166.67             | 25.9                                   | 28.2 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 167.06             | 24.5                                   | 29.1 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 167.91             | 25.1                                   | 31.0 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 168.21             | 20.1                                   | 23.0 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 484.00             | 26.4                                   | 23.9 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 7000.00            | -                                      | -    | n.t.                                | n.t. | <40.0                            | 42.8 | 1000                             | -                                | 54.0                          | 74.0                       |
| 10500.00           | -                                      | -    | n.t.                                | n.t. | 49.2                             | 45.9 | 1000                             | -                                | 54.0                          | 74.0                       |

Table 6 - 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 6 are more than 20 dB below the applicable limit.

#### Test engineer

Signature : 

Name : H.J. Pieters

Date : February 16, 2004



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

## 2.4 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 7.

| Frequency<br>(MHz) | Test results<br>quasi peak<br>(dBµV/m) |      | Test results<br>average<br>(dBµV/m) |      | Test results<br>peak<br>(dBµV/m) |      | Resolution<br>bandwidth<br>(kHz) | Quasi peak<br>limits<br>(dBµV/m) | Average<br>limits<br>(dBµV/m) | Peak<br>limits<br>(dBµV/m) |
|--------------------|----------------------------------------|------|-------------------------------------|------|----------------------------------|------|----------------------------------|----------------------------------|-------------------------------|----------------------------|
|                    | V                                      | H    | V                                   | H    | V                                | H    |                                  |                                  |                               |                            |
| 78.44              | 20.5                                   | 15.8 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 165.09             | 19.8                                   | 12.8 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 166.52             | 25.3                                   | 26.2 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 166.67             | 25.9                                   | 28.2 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 167.06             | 24.5                                   | 29.1 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 167.91             | 25.1                                   | 31.0 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 168.21             | 20.1                                   | 23.0 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 484.00             | 26.4                                   | 23.9 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 7080.00            | -                                      | -    | n.t.                                | n.t. | <40.0                            | 41.3 | 1000                             | -                                | 54.0                          | 74.0                       |
| 10620.00           | -                                      | -    | n.t.                                | n.t. | 47.2                             | 44.8 | 1000                             | -                                | 54.0                          | 74.0                       |

Table 7 - 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 7 are more than 20 dB below the applicable limit.

### Test engineer

Signature

Name : H.J. Pieters

Date : February 16, 2004



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

## 2.5 Test results with EUT operating in transmit mode on channel 36.

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 36 (5180 MHz), are depicted in table 8.

| Frequency<br>(MHz) | Test results<br>quasi peak<br>(dBµV/m) |      | Test results<br>average<br>(dBµV/m) |      | Test results<br>peak<br>(dBµV/m) |      | Resolution<br>bandwidth<br>(kHz) | Quasi peak<br>limits<br>(dBµV/m) | Average<br>limits<br>(dBµV/m) | Peak<br>limits<br>(dBµV/m) |
|--------------------|----------------------------------------|------|-------------------------------------|------|----------------------------------|------|----------------------------------|----------------------------------|-------------------------------|----------------------------|
|                    | V                                      | H    | V                                   | H    | V                                | H    |                                  |                                  |                               |                            |
| 78.44              | 20.5                                   | 15.8 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 165.09             | 19.8                                   | 12.8 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 166.52             | 25.3                                   | 26.2 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 166.67             | 25.9                                   | 28.2 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 167.06             | 24.5                                   | 29.1 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 167.91             | 25.1                                   | 31.0 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 168.21             | 20.1                                   | 23.0 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 484.00             | 26.4                                   | 23.9 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 6893.00            | -                                      | -    | n.t.                                | n.t. | 43.4                             | 45.6 | 1000                             | -                                | 54.0                          | 74.0                       |
| 10340.00           | -                                      | -    | n.t.                                | n.t. | 50.7                             | 49.7 | 1000                             | -                                | 54.0                          | 74.0                       |

Table 8 - Test results with the EUT operating in transmit mode on channel 36 (5180 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: 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 8.

Note: Field strength values of radiated 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 : February 23, 2004



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
 Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
 Manufacturer: Agere Systems Nederland B.V.  
 Brand mark: Agere  
 Model: 1102  
 FCC ID: IMR1102CB

## 2.6 Test results with EUT operating in transmit mode on channel 48.

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 48 (5240 MHz), are depicted in table 9.

| Frequency<br>(MHz) | Test results<br>quasi peak<br>(dBµV/m) |      | Test results<br>average<br>(dBµV/m) |      | Test results<br>peak<br>(dBµV/m) |      | Resolution<br>bandwidth<br>(kHz) | Quasi peak<br>limits<br>(dBµV/m) | Average<br>limits<br>(dBµV/m) | Peak<br>limits<br>(dBµV/m) |
|--------------------|----------------------------------------|------|-------------------------------------|------|----------------------------------|------|----------------------------------|----------------------------------|-------------------------------|----------------------------|
|                    | V                                      | H    | V                                   | H    | V                                | H    |                                  |                                  |                               |                            |
| 78.44              | 20.5                                   | 15.8 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 165.09             | 19.8                                   | 12.8 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 166.52             | 25.3                                   | 26.2 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 166.67             | 25.9                                   | 28.2 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 167.06             | 24.5                                   | 29.1 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 167.91             | 25.1                                   | 31.0 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 168.21             | 20.1                                   | 23.0 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 484.00             | 26.4                                   | 23.9 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 6973.00            | -                                      | -    | n.t.                                | n.t. | 41.8                             | 45.2 | 1000                             | -                                | 54.0                          | 74.0                       |
| 10460.00           | -                                      | -    | n.t.                                | n.t. | 50.7                             | 47.1 | 1000                             | -                                | 54.0                          | 74.0                       |

Table 9 - Test results with the EUT operating in transmit mode on channel 48 (5240 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: 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 9.

Note: Field strength values of radiated emissions at frequencies not listed in table 9 are more than 20 dB below the applicable limit.

### Test engineer

Signature : 

Name : H.J. Pieters

Date : February 23, 2004



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
 Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
 Manufacturer: Agere Systems Nederland B.V.  
 Brand mark: Agere  
 Model: 1102  
 FCC ID: IMR1102CB

## 2.7 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 10.

| Frequency<br>(MHz) | Test results<br>quasi peak<br>(dBµV/m) |      | Test results<br>average<br>(dBµV/m) |      | Test results<br>peak<br>(dBµV/m) |      | Resolution<br>bandwidth<br>(kHz) | Quasi peak<br>limits<br>(dBµV/m) | Average<br>limits<br>(dBµV/m) | Peak<br>limits<br>(dBµV/m) |
|--------------------|----------------------------------------|------|-------------------------------------|------|----------------------------------|------|----------------------------------|----------------------------------|-------------------------------|----------------------------|
|                    | V                                      | H    | V                                   | H    | V                                | H    |                                  |                                  |                               |                            |
| 78.44              | 20.5                                   | 15.8 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 165.09             | 19.8                                   | 12.8 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 166.52             | 25.3                                   | 26.2 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 166.67             | 25.9                                   | 28.2 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 167.06             | 24.5                                   | 29.1 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 167.91             | 25.1                                   | 31.0 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 168.21             | 20.1                                   | 23.0 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 484.00             | 26.4                                   | 23.9 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 7000.00            | -                                      | -    | n.t.                                | n.t. | 41.1                             | 45.3 | 1000                             | -                                | 54.0                          | 74.0                       |
| 10500.00           | -                                      | -    | n.t.                                | n.t. | 49.5                             | 45.6 | 1000                             | -                                | 54.0                          | 74.0                       |

Table 10 - Test results with the EUT operating in transmit 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: 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 10.

Note: Field strength values of radiated emissions at frequencies not listed in table 10 are more than 20 dB below the applicable limit.

### Test engineer

Signature

Name : H.J. Pieters

Date : February 23, 2004



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

## 2.8 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 11.

| Frequency<br>(MHz) | Test results<br>quasi peak<br>(dBµV/m) |      | Test results<br>average<br>(dBµV/m) |      | Test results<br>peak<br>(dBµV/m) |      | Resolution<br>bandwidth<br>(kHz) | Quasi peak<br>limits<br>(dBµV/m) | Average<br>limits<br>(dBµV/m) | Peak<br>limits<br>(dBµV/m) |
|--------------------|----------------------------------------|------|-------------------------------------|------|----------------------------------|------|----------------------------------|----------------------------------|-------------------------------|----------------------------|
|                    | V                                      | H    | V                                   | H    | V                                | H    |                                  |                                  |                               |                            |
| 78.44              | 20.5                                   | 15.8 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 165.09             | 19.8                                   | 12.8 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 166.52             | 25.3                                   | 26.2 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 166.67             | 25.9                                   | 28.2 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 167.06             | 24.5                                   | 29.1 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 167.91             | 25.1                                   | 31.0 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 168.21             | 20.1                                   | 23.0 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 484.00             | 26.4                                   | 23.9 | -                                   | -    | -                                | -    | 120                              | 46.0                             | -                             | -                          |
| 7080.00            | -                                      | -    | n.t.                                | n.t. | 41.4                             | 44.8 | 1000                             | -                                | 54.0                          | 74.0                       |
| 10620.00           | -                                      | -    | n.t.                                | n.t. | 52.4                             | 46.2 | 1000                             | -                                | 54.0                          | 74.0                       |

Table 11 - Test results with the EUT operating in transmit 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: 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 11.

Note: Field strength values of radiated emissions at frequencies not listed in table 11 are more than 20 dB below the applicable limit.

### Test engineer

Signature

Name : H.J. Pieters

Date : February 23, 2004



### 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 36 (5180 MHz), 48 (5240 MHz), 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 12.

| Frequency<br>(MHz) | Measurement results<br>dB(μV)<br>Neutral |      | Measurement results<br>dB(μV)<br>Line 1 |      | Limits<br>dB(μV) |      | Margin<br>(dB)<br>Neutral |       | Margin<br>(dB)<br>Line 1 |       | Result |
|--------------------|------------------------------------------|------|-----------------------------------------|------|------------------|------|---------------------------|-------|--------------------------|-------|--------|
|                    | QP                                       | AV   | QP                                      | AV   | QP               | AV   | QP                        | AV    | QP                       | AV    |        |
| 0.15               | 42.1                                     | 13.5 | 43.9                                    | 14.9 | 66.0             | 56.0 | -23.9                     | -42.5 | -22.1                    | -41.1 | PASS   |
| 0.20               | 46.2                                     | 38.8 | 46.5                                    | 39.0 | 63.6             | 53.6 | -17.4                     | -14.8 | -17.1                    | -14.6 | PASS   |
| 0.56               | 41.9                                     | 38.3 | 41.9                                    | 38.4 | 56.0             | 46.0 | -14.1                     | -7.7  | -14.1                    | -7.6  | PASS   |
| 1.21               | 38.6                                     | 36.0 | 38.6                                    | 35.9 | 56.0             | 46.0 | -17.4                     | -10.0 | -17.4                    | -10.1 | PASS   |
| 2.88               | 35.6                                     | 30.0 | 35.6                                    | 29.2 | 56.0             | 46.0 | -20.4                     | -16.0 | -20.4                    | -16.8 | PASS   |
| 4.92               | 30.7                                     | 24.4 | 30.5                                    | 24.5 | 56.0             | 46.0 | -25.3                     | -21.6 | -25.5                    | -21.5 | PASS   |
| 8.30               | 33.4                                     | 27.1 | 32.3                                    | 27.1 | 60.0             | 50.0 | -26.6                     | -22.9 | -27.7                    | -22.9 | PASS   |
| 9.74               | 28.0                                     | 22.7 | 28.3                                    | 23.1 | 60.0             | 50.0 | -32.0                     | -27.3 | -31.7                    | -26.9 | PASS   |
| 12.85              | 21.5                                     | 16.1 | 21.1                                    | 16.0 | 60.0             | 50.0 | -38.5                     | -33.9 | -38.9                    | -34.0 | PASS   |
| 16.50              | 15.6                                     | 8.7  | 17.3                                    | 10.8 | 60.0             | 50.0 | -44.4                     | -41.3 | -42.7                    | -39.2 | PASS   |
| 20.20              | 15.0                                     | 9.9  | 16.0                                    | 10.7 | 60.0             | 50.0 | -45.0                     | -40.1 | -44.0                    | -39.3 | PASS   |
| 26.50              | 22.7                                     | 17.5 | 23.7                                    | 18.3 | 60.0             | 50.0 | -37.3                     | -32.5 | -36.3                    | -31.7 | PASS   |
| 29.50              | 19.7                                     | 14.5 | 20.6                                    | 16.0 | 60.0             | 50.0 | -40.3                     | -35.5 | -39.4                    | -34.0 | PASS   |

Table 12 - Test results with the EUT operating in transmit/receive mode.

Note: Disturbance voltage values of conducted emissions at frequencies not listed in table 12 are more than 20 dB below the applicable limit.

#### Test engineer

Signature : 

Name : H.J. Pieters

Date : February 23, 2004



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

### 4.1 Power limits.

#### 4.1.1 Frequency band of 5.15 – 5.25 GHz.

The results of tests on the EUT, carried out in accordance with 47 CFR Part 15.407 (a)(1) in order to determine the –26 dB emission bandwidth of the transmitter signal, are depicted in table 13.

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<br>bit-rate<br>(Mbit/s) | –26 dBm emission bandwidth (kHz) |                   |
|--------------------------------------|----------------------------------|-------------------|
|                                      | Ch. 36 (5180 MHz)                | Ch. 48 (5240 MHz) |
| 6                                    | 34500                            | 35250             |
| 9                                    | 34800                            | 34950             |
| 18                                   | 30150                            | 30150             |
| 36                                   | 25800                            | 30450             |
| 54                                   | 28500                            | 30300             |

Table 13 – The results of the –26 dB emission bandwidth measurements

From table 13 above it can be derived that the minimum –26 dB emission bandwidth is 25.8 MHz.

The peak transmit power limit, based on the –26 dB emission bandwidth, in the frequency band of 5.15 – 5.25 GHz can be calculated as follows:

$4 \text{ dBm} + 10 \log B$ , where B is the –26 dB emission bandwidth in MHz;

$4 \text{ dBm} + 10 \log 25.8 = 4 \text{ dBm} + 14.1 = 18.1 \text{ dBm}$  (64.6 mW).

In accordance with 47 CFR Part 15.407 (a)(1) the peak transmit power in the frequency band of 5.15 – 5.25 GHz shall not exceed the lesser of 50 mW or  $4 \text{ dBm} + 10 \log B$ , 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 5.15 – 5.25 GHz is 18.1 dBm (64.6 mW).

In accordance with 47 CFR Part 15.407 (a)(1) the peak transmit power limit, in the frequency band of 5.15 – 5.25 GHz, has been set to 17.0 dBm (50 mW).

#### Test engineer

Signature

Name : Onno H. Hoekstra

Date : February 17, 2004



#### 4.1.2 Frequency band of 5.25 – 5.35 GHz.

The results of tests on the EUT, carried out in accordance with 47 CFR Part 15.407 (a)(1) in order to determine the –26 dB emission bandwidth of the transmitter signal, are depicted in table 14.

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<br>bit-rate<br>(Mbit/s) | -26 dBm emission bandwidth (kHz) |                   |
|--------------------------------------|----------------------------------|-------------------|
|                                      | Ch. 52 (5260 MHz)                | Ch. 64 (5320 MHz) |
| 6                                    | 34050                            | 33900             |
| 9                                    | 35250                            | 33150             |
| 18                                   | 30300                            | 30150             |
| 36                                   | 29100                            | 27900             |
| 54                                   | 29550                            | 28800             |

Table 14 – The results of the –26 dB emission bandwidth measurements

From table 14 above it can be derived that the minimum –26 dB emission bandwidth is 27.9 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 27.9 = 11 dBm + 14.5 = 25.5 dBm (354.8 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 25.5 dBm (354.8 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 24 dBm (250 mW).

#### Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : February 17, 2004



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

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#### 4.1.3 Frequency band of 5.725 – 5.825 GHz.

47 CFR Part 15.407 (a)(3) is not applicable to the EUT.

##### Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : February 17, 2004



## 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 15. 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)(1) and 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<br>bit-rate<br>(Mbit/s) | Maximum peak transmit output power (conducted, mW) |                   |                   |                   | Limit (conducted, mW)<br>Antenna gain < 6 dBi |               |
|--------------------------------------|----------------------------------------------------|-------------------|-------------------|-------------------|-----------------------------------------------|---------------|
|                                      | Ch. 36 (5180 MHz)                                  | Ch. 48 (5240 MHz) | Ch. 52 (5260 MHz) | Ch. 64 (5320 MHz) | 5150-5250 MHz                                 | 5250-5350 MHz |
| 6                                    | 9.8                                                | 9.9               | 10.6              | 10.9              | 50.0                                          | 250.0         |
| 9                                    | 9.1                                                | 10.2              | 10.3              | 10.9              | 50.0                                          | 250.0         |
| 18                                   | 8.9                                                | 10.8              | 10.3              | 10.9              | 50.0                                          | 250.0         |
| 36                                   | 9.9                                                | 11.8              | 11.9              | 12.3              | 50.0                                          | 250.0         |
| 54                                   | 10.5                                               | 11.7              | 11.7              | 12.4              | 50.0                                          | 250.0         |

Table 15 - 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 15. 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 : February 17, 2004



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

### 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 16. 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)(1) and 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<br>bit-rate<br>(Mbit/s) | Peak power spectral density in any 1 MHz band (conducted, dBm) |                   |                   |                   | Limit (conducted, dBm) |               |
|--------------------------------------|----------------------------------------------------------------|-------------------|-------------------|-------------------|------------------------|---------------|
|                                      | Ch. 36 (5180 MHz)                                              | Ch. 48 (5240 MHz) | Ch. 52 (5260 MHz) | Ch. 64 (5320 MHz) | 5150-5250 MHz          | 5250-5350 MHz |
| 6                                    | -4.9                                                           | -4.6              | -4.1              | -4.1              | 4.0                    | 11.0          |
| 9                                    | -4.8                                                           | -4.4              | -4.6              | -3.9              | 4.0                    | 11.0          |
| 18                                   | -5.1                                                           | -4.2              | -4.3              | -4.0              | 4.0                    | 11.0          |
| 36                                   | -5.0                                                           | -4.1              | -4.1              | -4.2              | 4.0                    | 11.0          |
| 54                                   | -4.8                                                           | -4.5              | -4.6              | -4.3              | 4.0                    | 11.0          |

Table 16 - Peak power spectral density (conducted).

Test engineer

Signature

Name : Onno H. Hoekstra

Date : February 17, 2004



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

#### 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 17.

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<br>bit-rate<br>(Mbit/s) | Ratio of the peak excursion of the modulation envelope (dB) |                   |                   |                   | Limit (dB) |
|--------------------------------------|-------------------------------------------------------------|-------------------|-------------------|-------------------|------------|
|                                      | Ch. 36 (5180 MHz)                                           | Ch. 48 (5240 MHz) | Ch. 52 (5260 MHz) | Ch. 64 (5320 MHz) |            |
| 6                                    | 11.2                                                        | 10.6              | 11.1              | 11.8              | < 13.0     |
| 9                                    | 11.5                                                        | 11.1              | 11.9              | 11.1              | < 13.0     |
| 18                                   | 11.2                                                        | 11.5              | 11.8              | 11.3              | < 13.0     |
| 36                                   | 11.4                                                        | 12.1              | 11.8              | 12.3              | < 13.0     |
| 54                                   | 11.5                                                        | 11.6              | 12.0              | 11.6              | < 13.0     |

Table 17 – Ratio of the peak excursion of the modulation envelope.

Test engineer

Signature

: 

Name : Onno H. Hoekstra

Date : February 17, 2004



## **4.5 Peak emissions outside the frequency bands of operation.**

### **4.5.1 Transmitters operating in the 5.15 – 5.25 GHz frequency band.**

In accordance with 47 CFR Part 15.407 (b)(1) all emissions outside of the 5.15 – 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 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 5.15 – 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.

### **4.5.3 Transmitters operating in the 5.725 – 5.825 GHz frequency band.**

Not applicable.

### **4.5.4 Unwanted emissions below 1 GHz.**

In accordance with 47 CFR Part 15.407 (b)(5) 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 are 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.

### **4.5.5 Restricted bands of operation.**

In accordance with 47 CFR Part 15.407 (b)(6), 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.



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

#### 4.5.5.1 Emission in restricted bands nearest to the band 5.15 – 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 5.15 – 5.35 MHz and with the EUT operating in transmit mode, are depicted in table 18.

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) |
|-----------------|----------------------------------|-------------------------------|----------------------------|----------------------------|----------------------------|-------------------------|----------------------|
| 5146.80         | -                                | 41.8                          | 68.4                       | 1000                       | -                          | 54.0                    | 74.0                 |
| 5150.00         | -                                | 51.8                          | 67.5                       | 1000                       | -                          | 54.0                    | 74.0                 |
| 5350.00         | -                                | 48.6                          | 67.6                       | 1000                       | -                          | 54.0                    | 74.0                 |

Table 18 - 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 18.

Note: Field strength values of conducted emissions at frequencies not listed in table 18 are more than 20 dB below the applicable limit.

#### Test engineer

Signature : 

Name : Onno H. Hoekstra

Date : February 17, 2004



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

#### 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 Transmitting antenna.

In accordance with 47 CFR Part 15.407 (d) any U-NII device that operates in the 5.15 – 5.25 GHz frequency band shall use a transmitting antenna that is an integral part of the device.

The EUT incorporates an integral antenna.

#### 4.8 Indoor operations.

In accordance with 47 CFR Part 15.407 (e) U-NII devices operating in 5.15 – 5.25 GHz frequency band are restricted to indoor operations only.

The applicant has declared that the EUT is intended for indoor operations only.

#### 4.9 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.

#### 4.10 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.

The results of tests on the EUT, carried out in order to determine the frequency stability under extreme temperature conditions combined with variations in the AC supply voltage, are depicted in table 19.

| Test conditions |             | Frequency (MHz)       |                       |                       |
|-----------------|-------------|-----------------------|-----------------------|-----------------------|
|                 |             | Channel 36 (5180 MHz) | Channel 52 (5260 MHz) | Channel 64 (5320 MHz) |
| T = +21 °C      | V = 230 VAC | 5180.0693             | 5260.0693             | 5320.0693             |
| T = 0 °C        | V = 207 VAC | 5180.0831             | 5260.0813             | 5320.0815             |
|                 | V = 253 VAC | 5180.0831             | 5260.0813             | 5320.0815             |
| T = +35 °C      | V = 207 VAC | 5180.0673             | 5260.0683             | 5320.0695             |
|                 | V = 253 VAC | 5180.0673             | 5260.0683             | 5320.0695             |

Table 19 – Frequency stability

Test engineer

Signature :  Name : Onno H. Hoekstra Date : February 26, 2003



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

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## 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

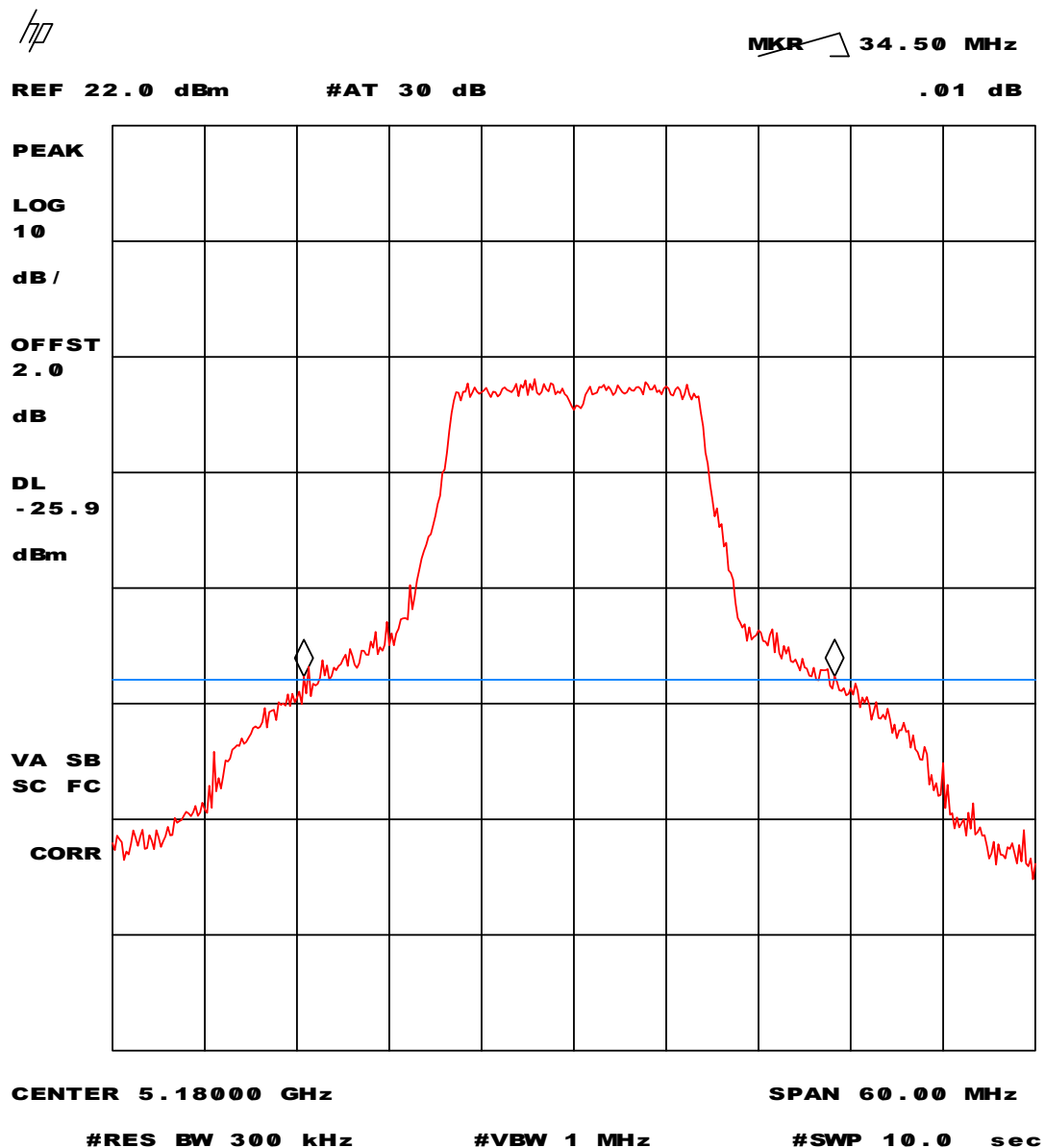
Signature : 

Name : Onno H. Hoekstra

Date : February 17, 2004

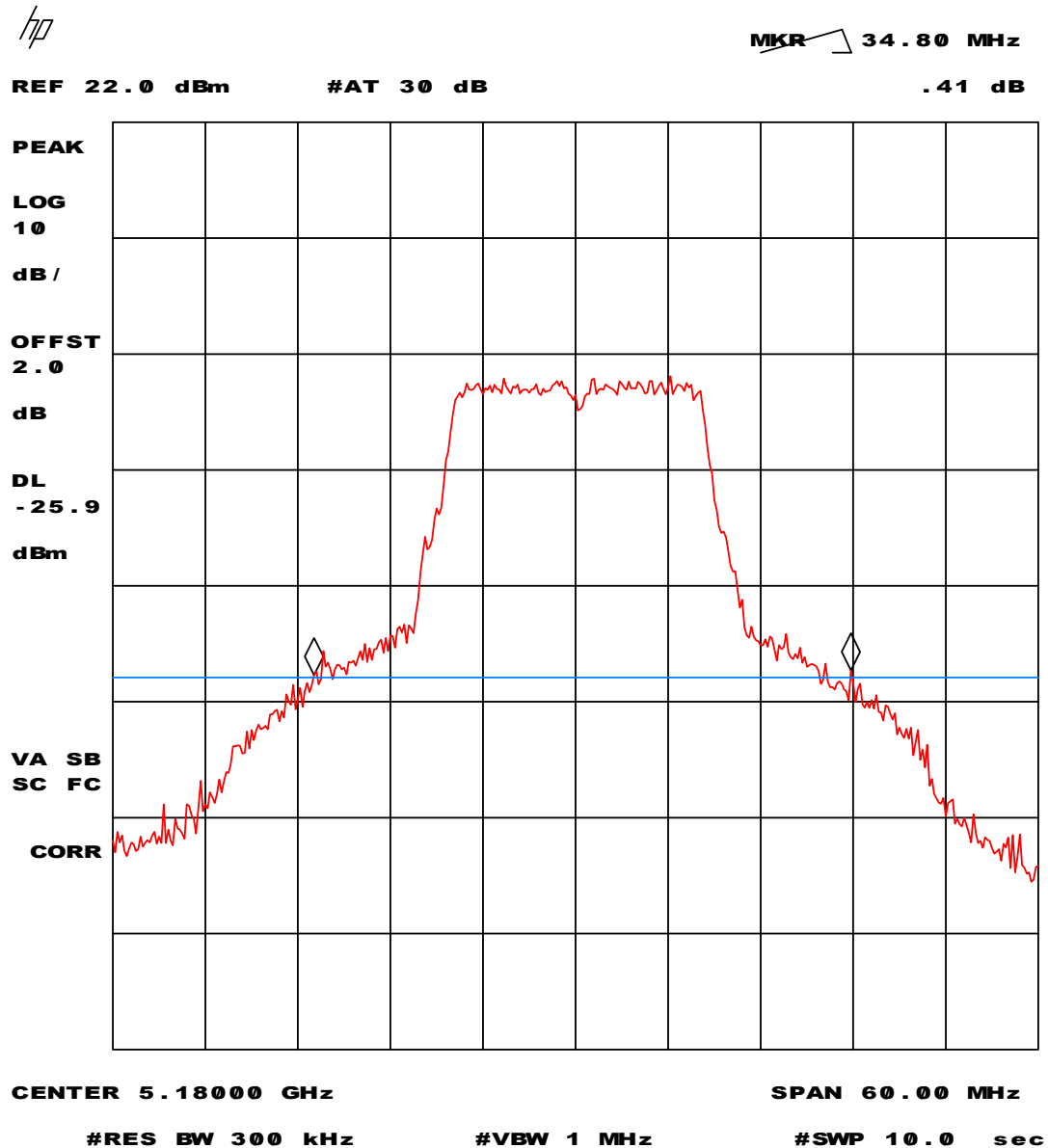


## 5.1 Emission bandwidth “B” MHz.



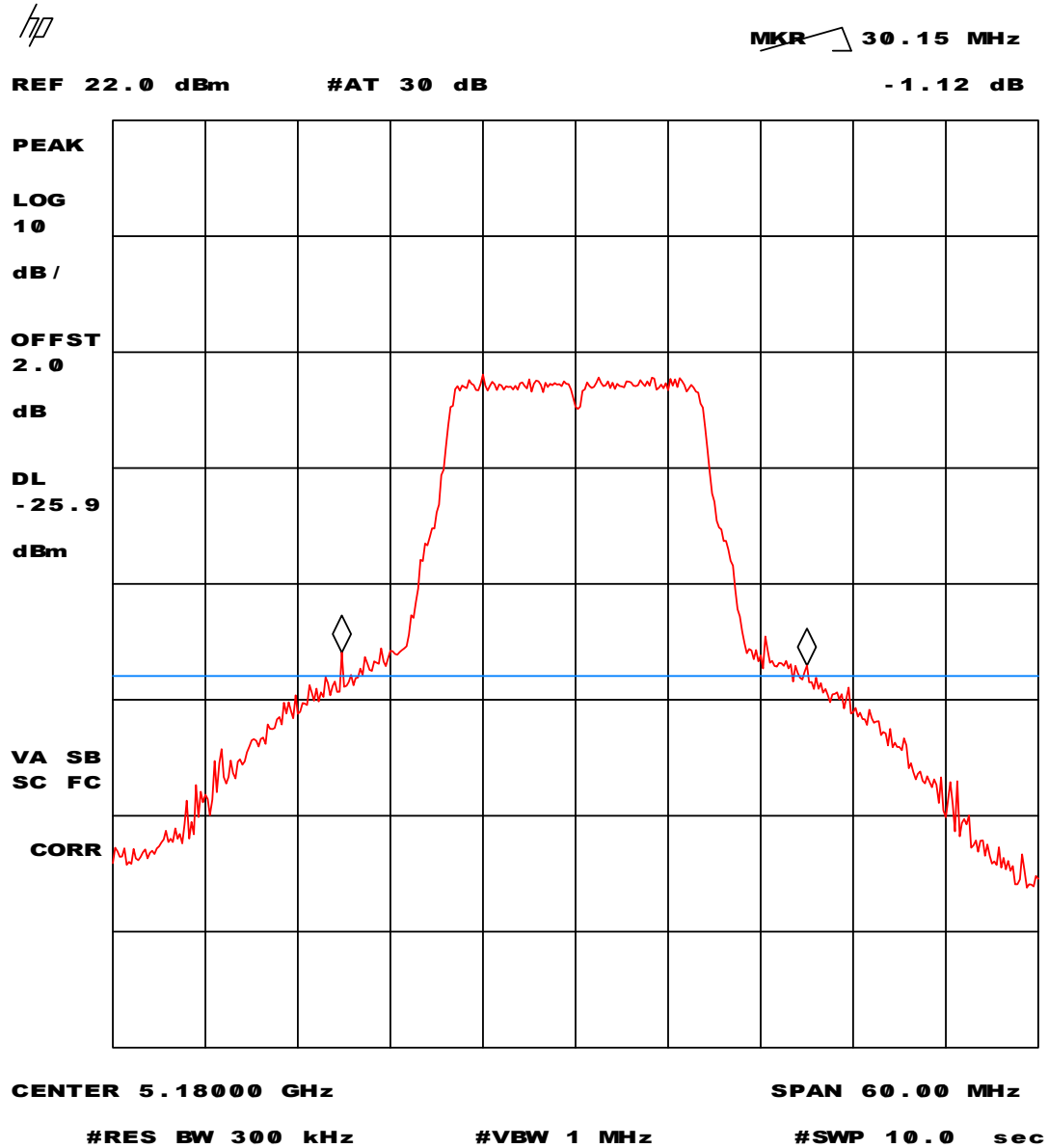
Plot 1 – Emission bandwidth (conducted, -26 dB).

Plot 1 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 6 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



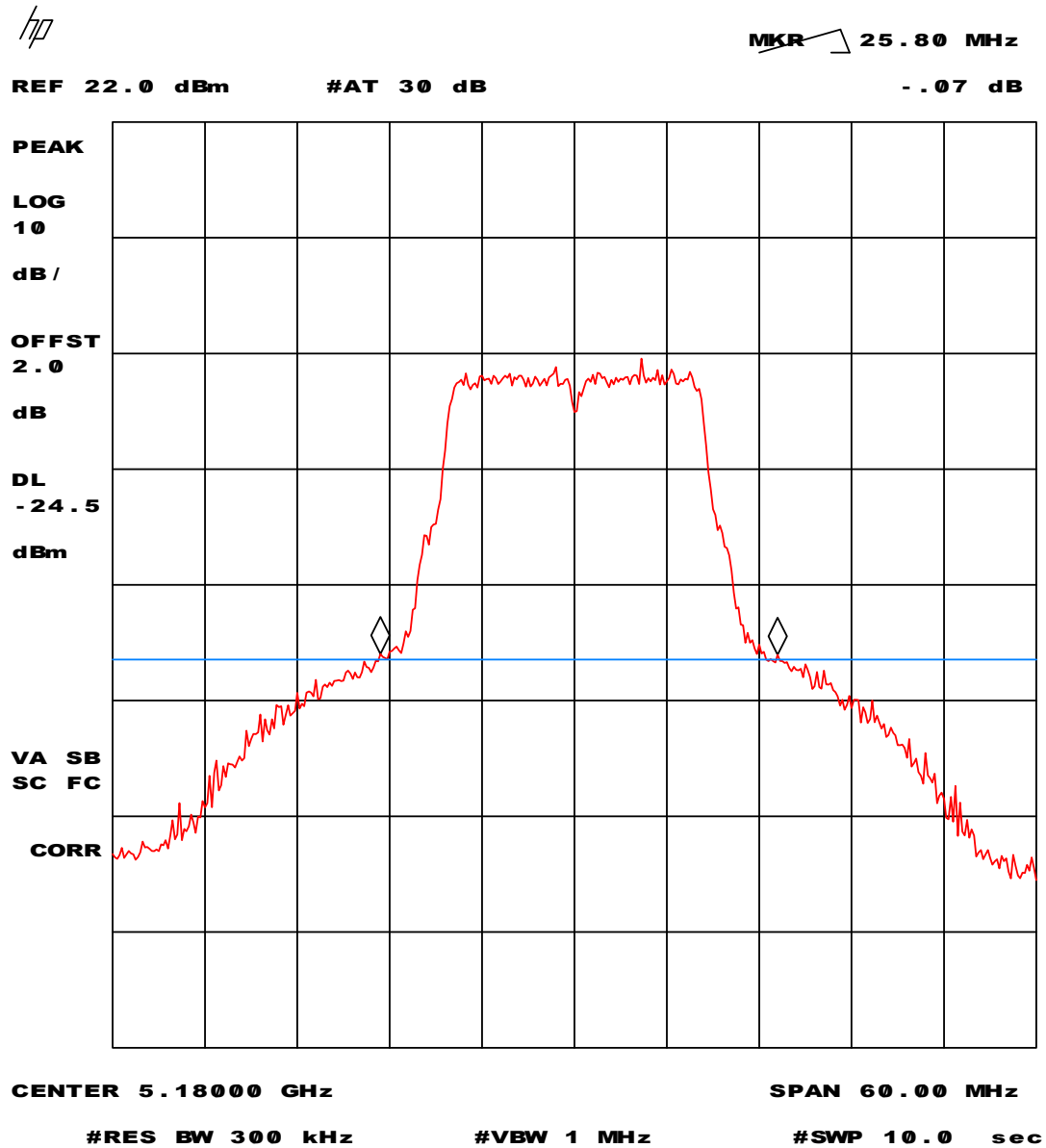
Plot 2 – Emission bandwidth (conducted, -26 dB).

Plot 2 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 9 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



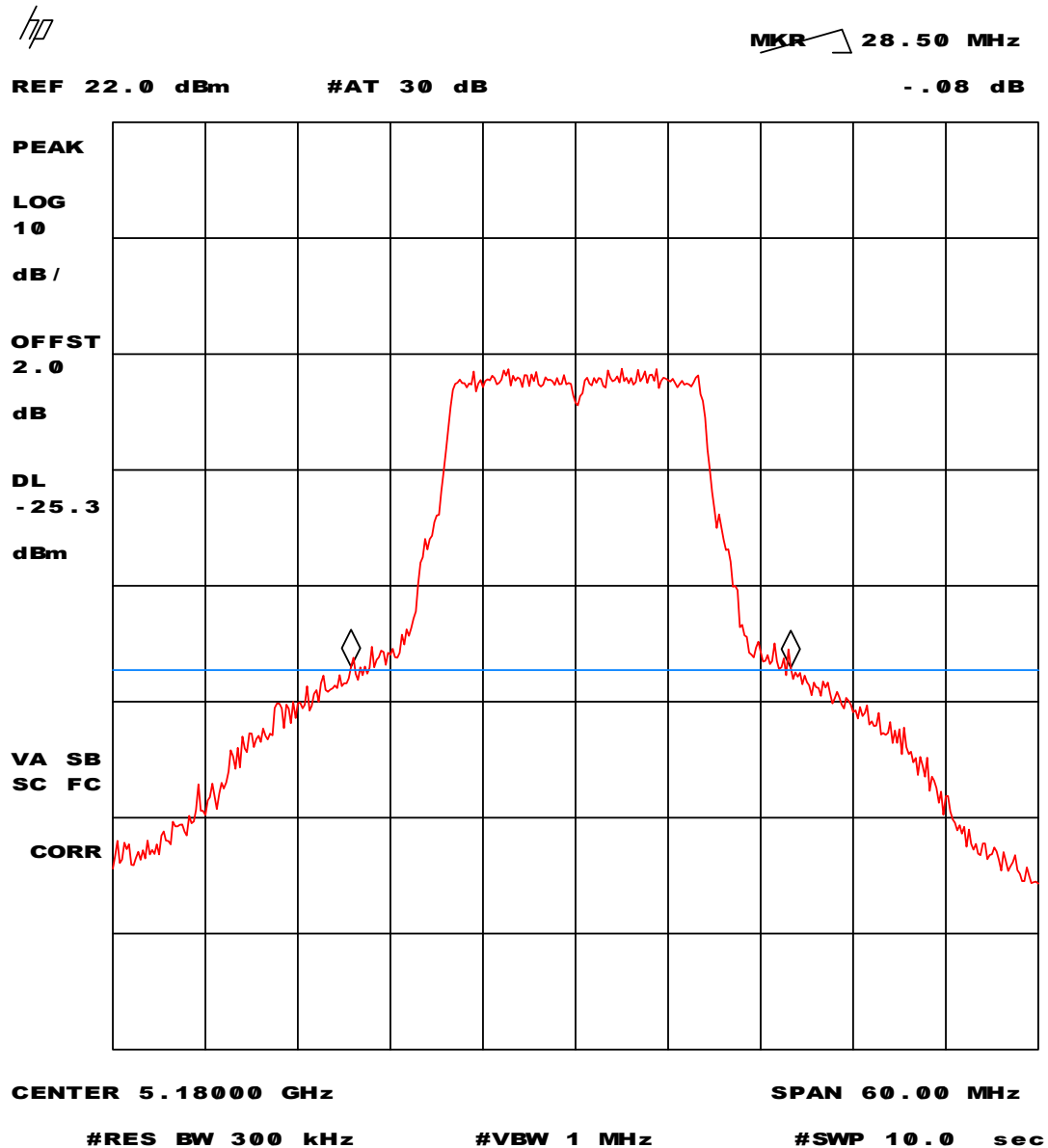
Plot 3 – Emission bandwidth (conducted, -26 dB).

Plot 3 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 18 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



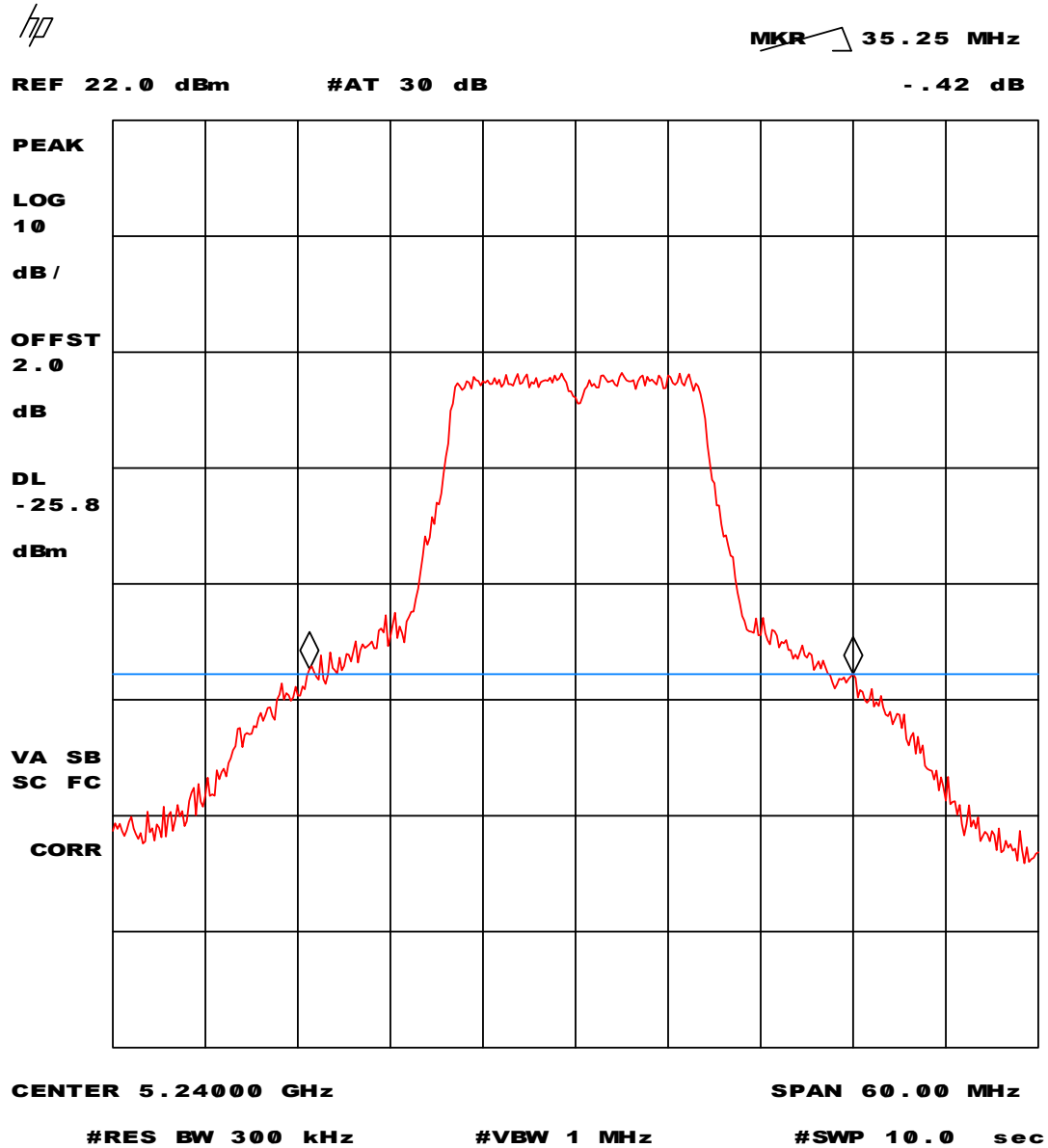
Plot 4 – Emission bandwidth (conducted, -26 dB).

Plot 4 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 36 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



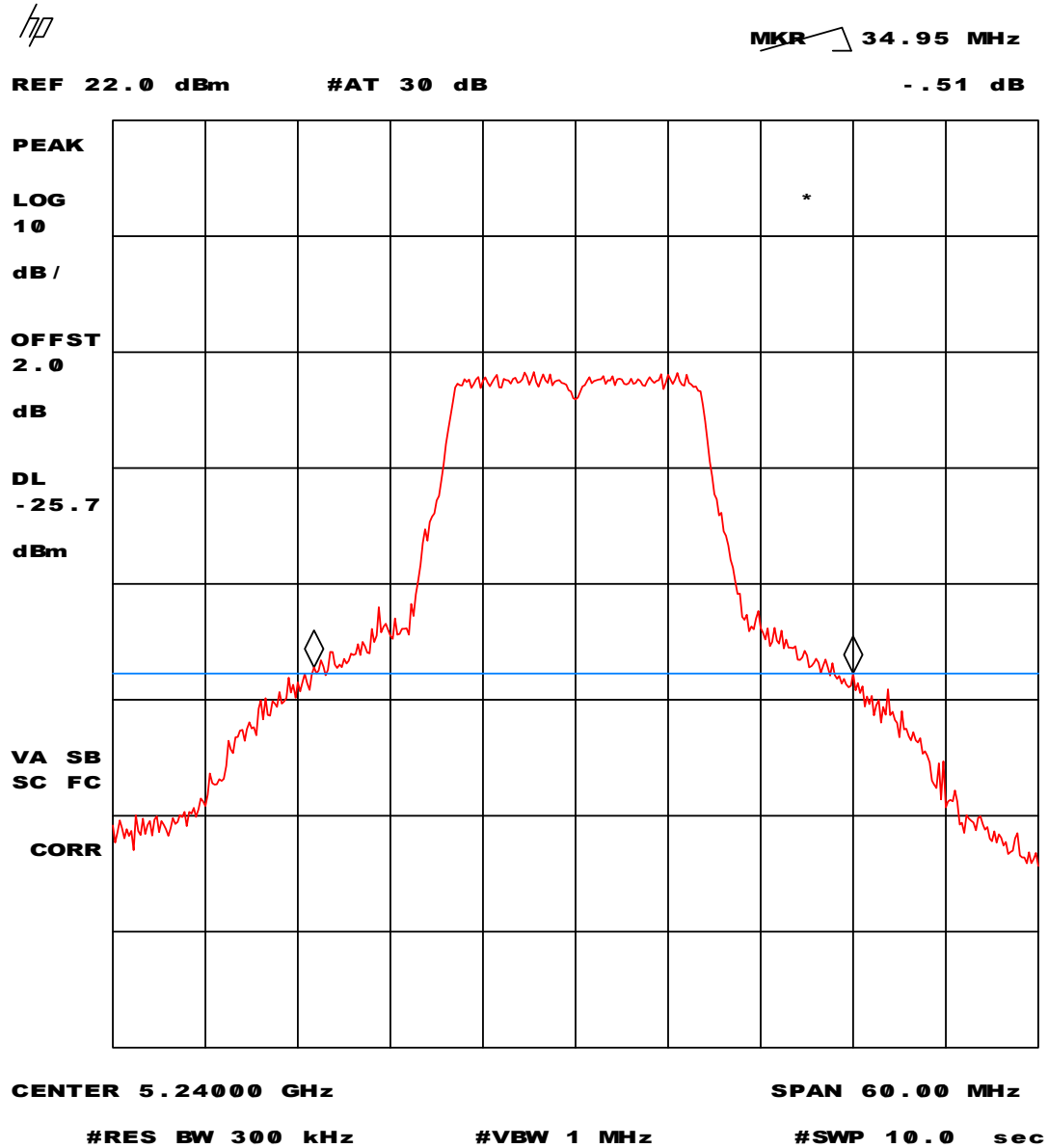
Plot 5 – Emission bandwidth (conducted, -26 dB).

Plot 5 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 54 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



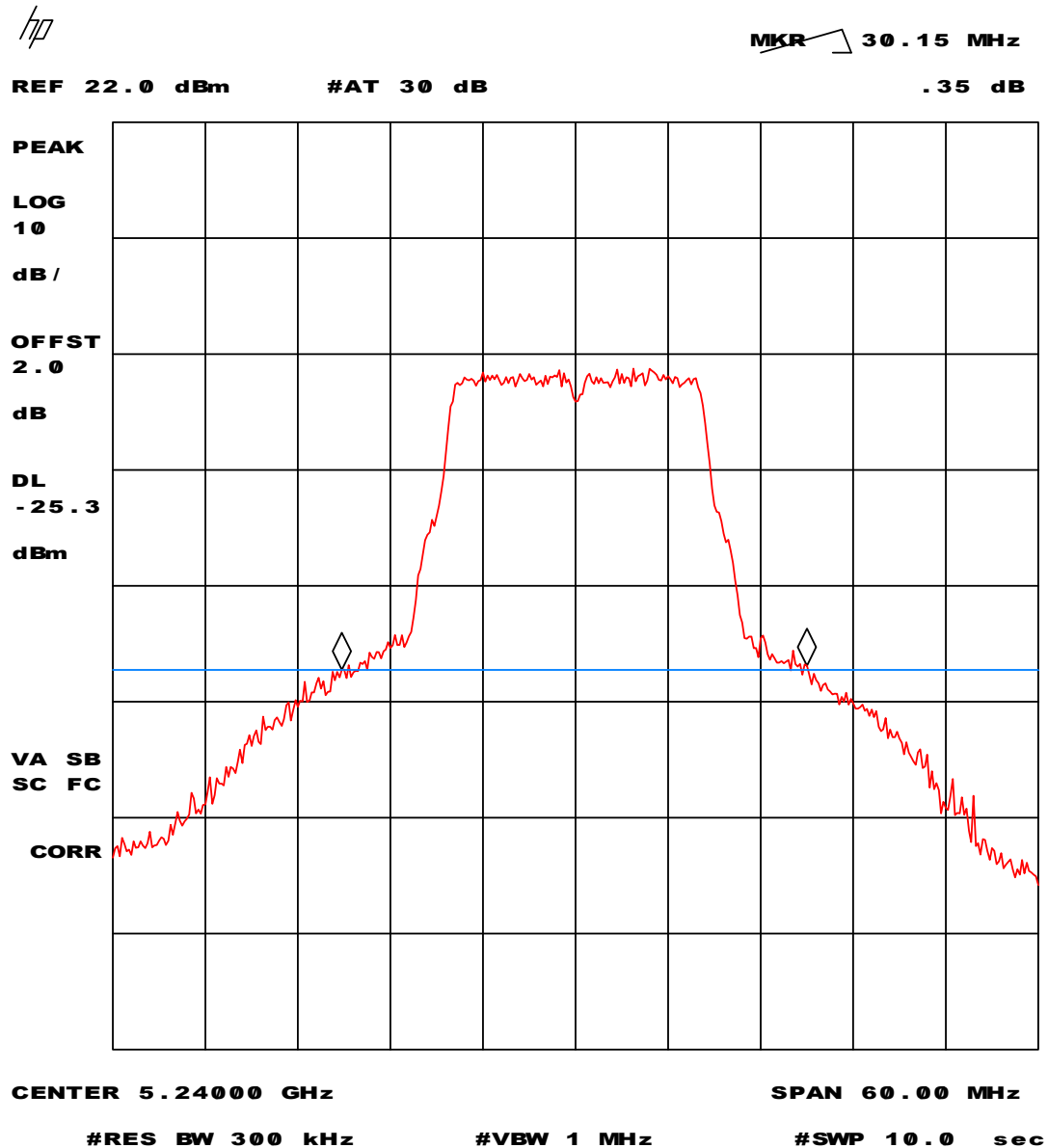
Plot 6 – Emission bandwidth (conducted, -26 dB).

Plot 6 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 6 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



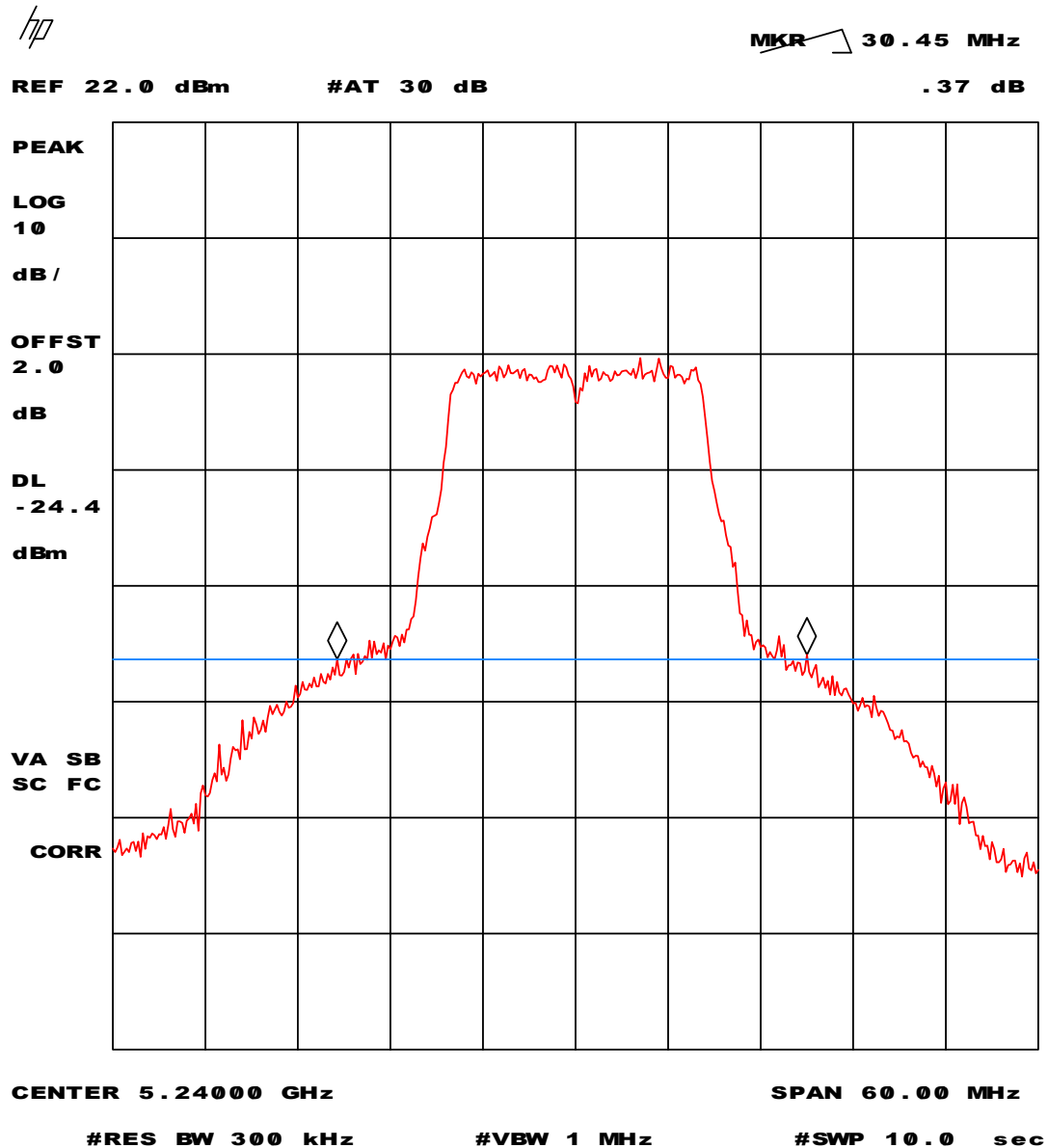
Plot 7 – Emission bandwidth (conducted, -26 dB).

Plot 7 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 9 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



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

Plot 8 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 18 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.

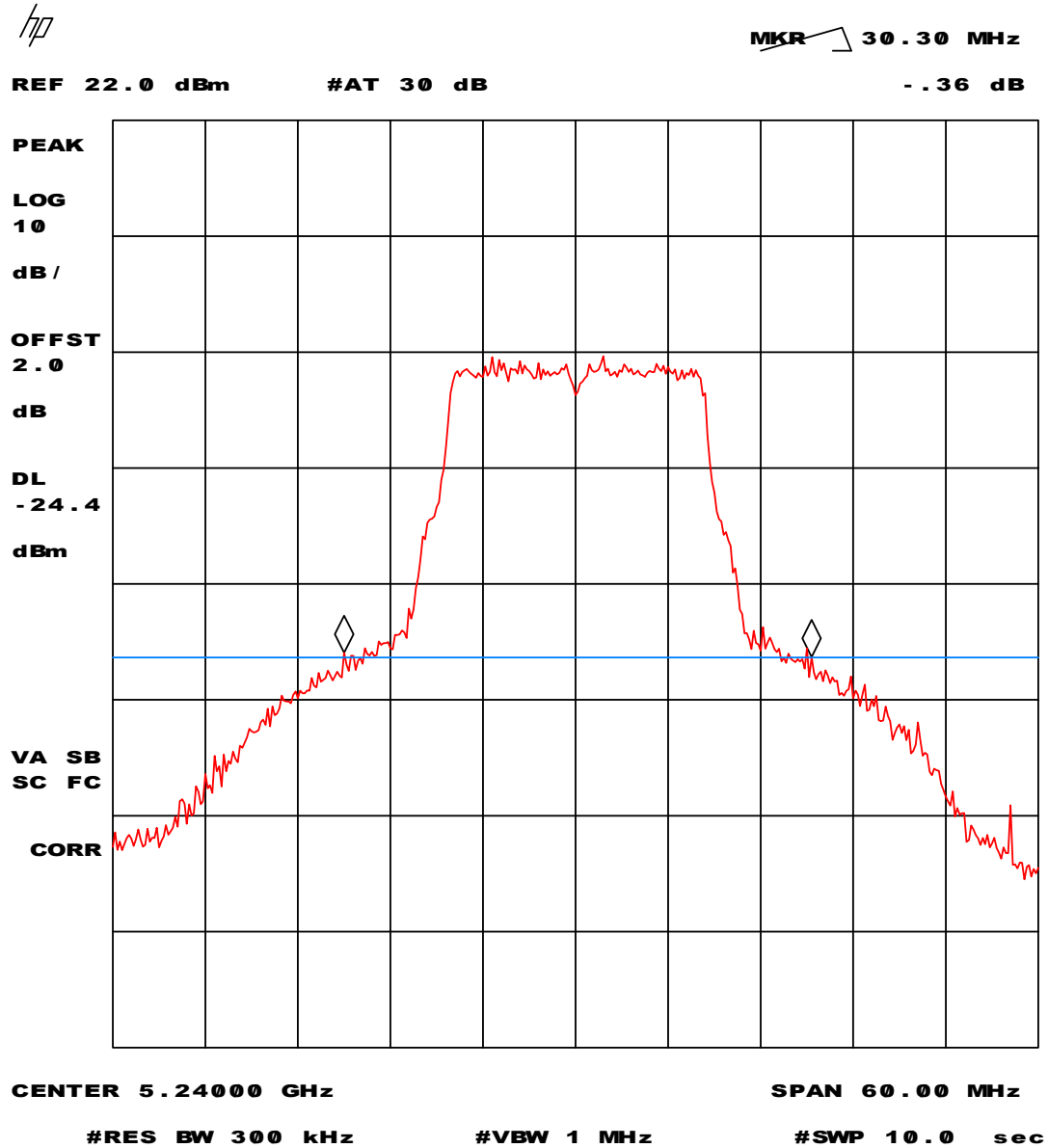


Plot 9 – Emission bandwidth (conducted, -26 dB).

Plot 9 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 36 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.

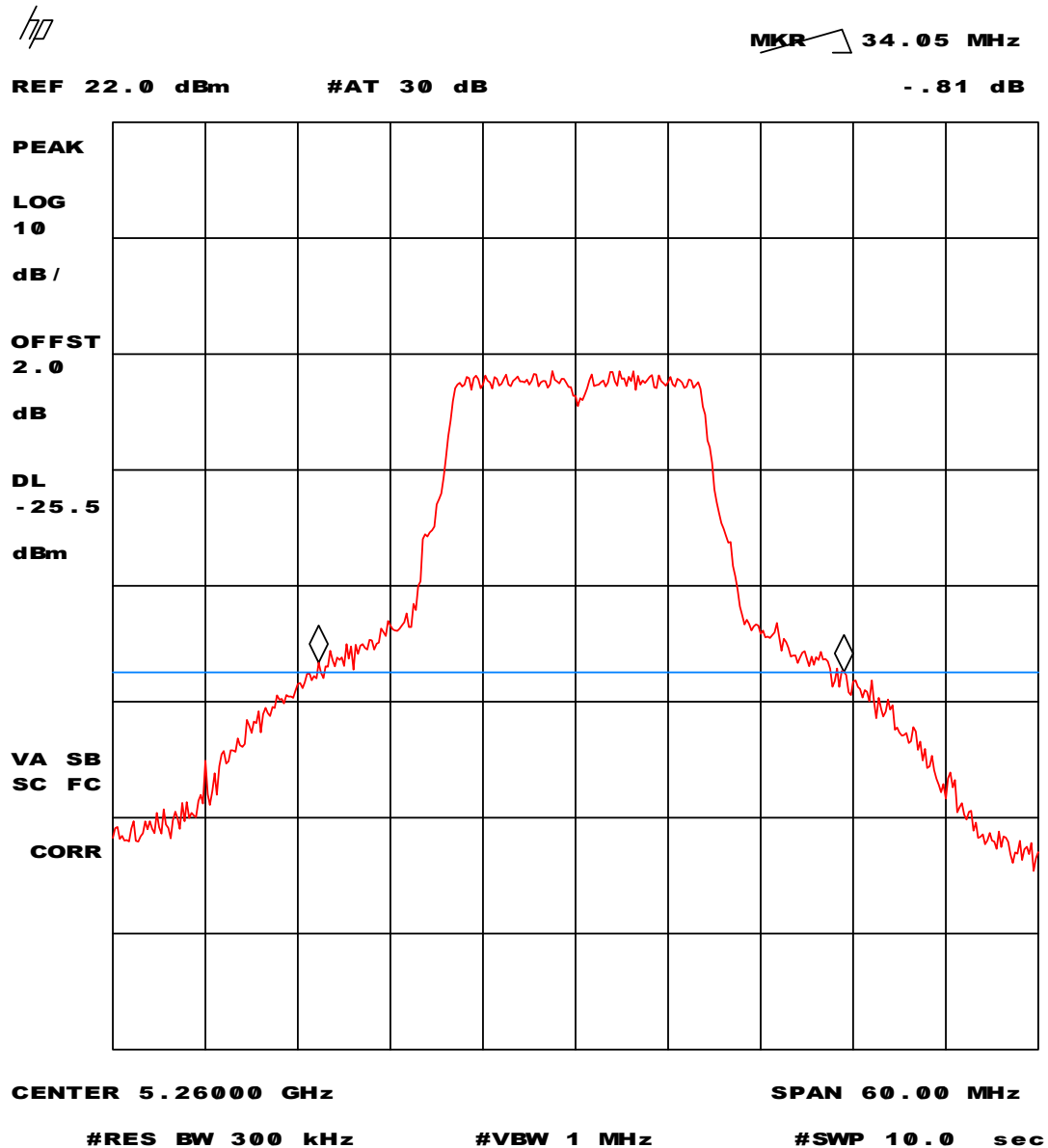


Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB



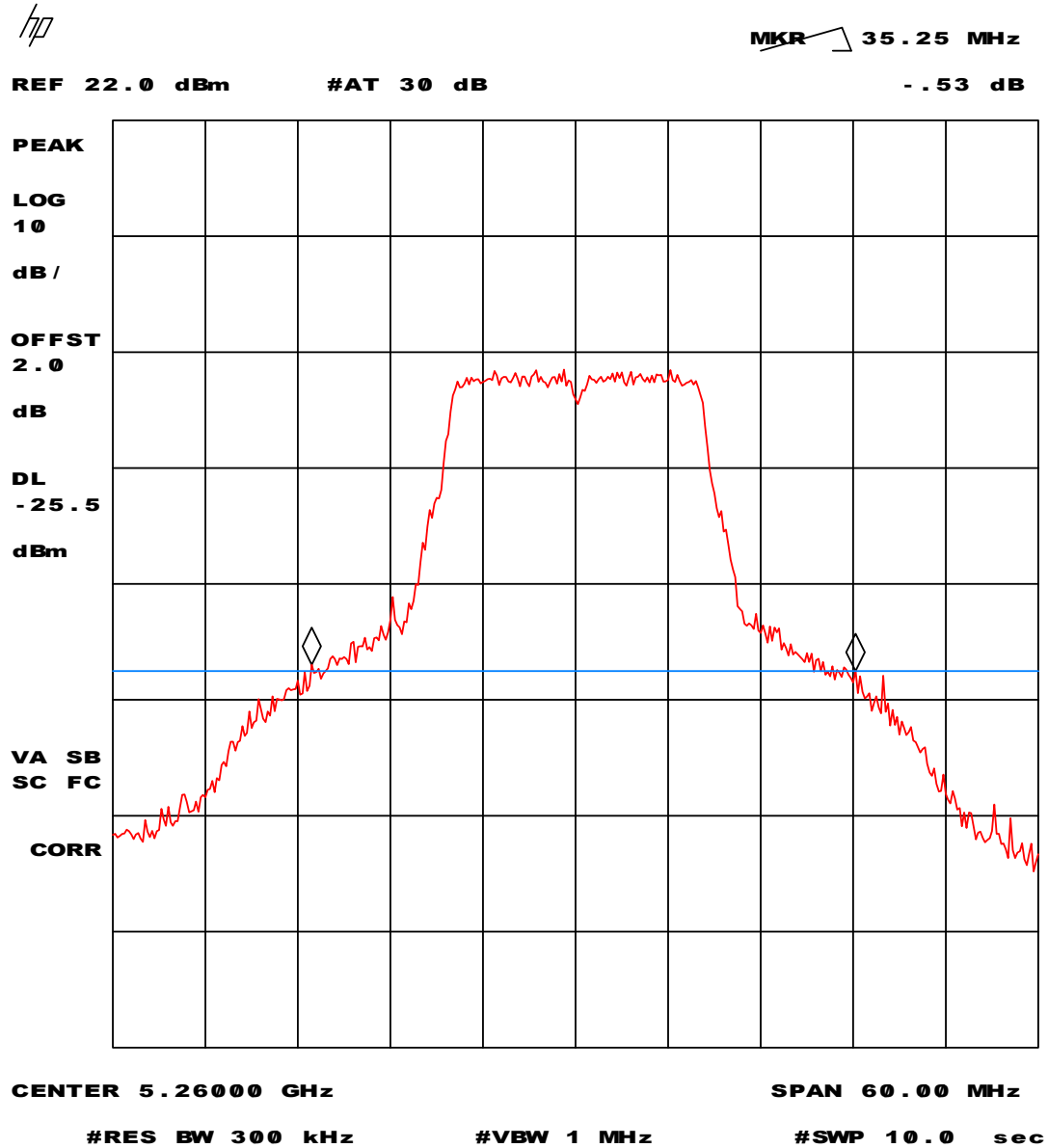
Plot 10 – Emission bandwidth (conducted, -26 dB).

Plot 10 depicts the emission bandwidth (conducted, -26 dB) with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 54 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



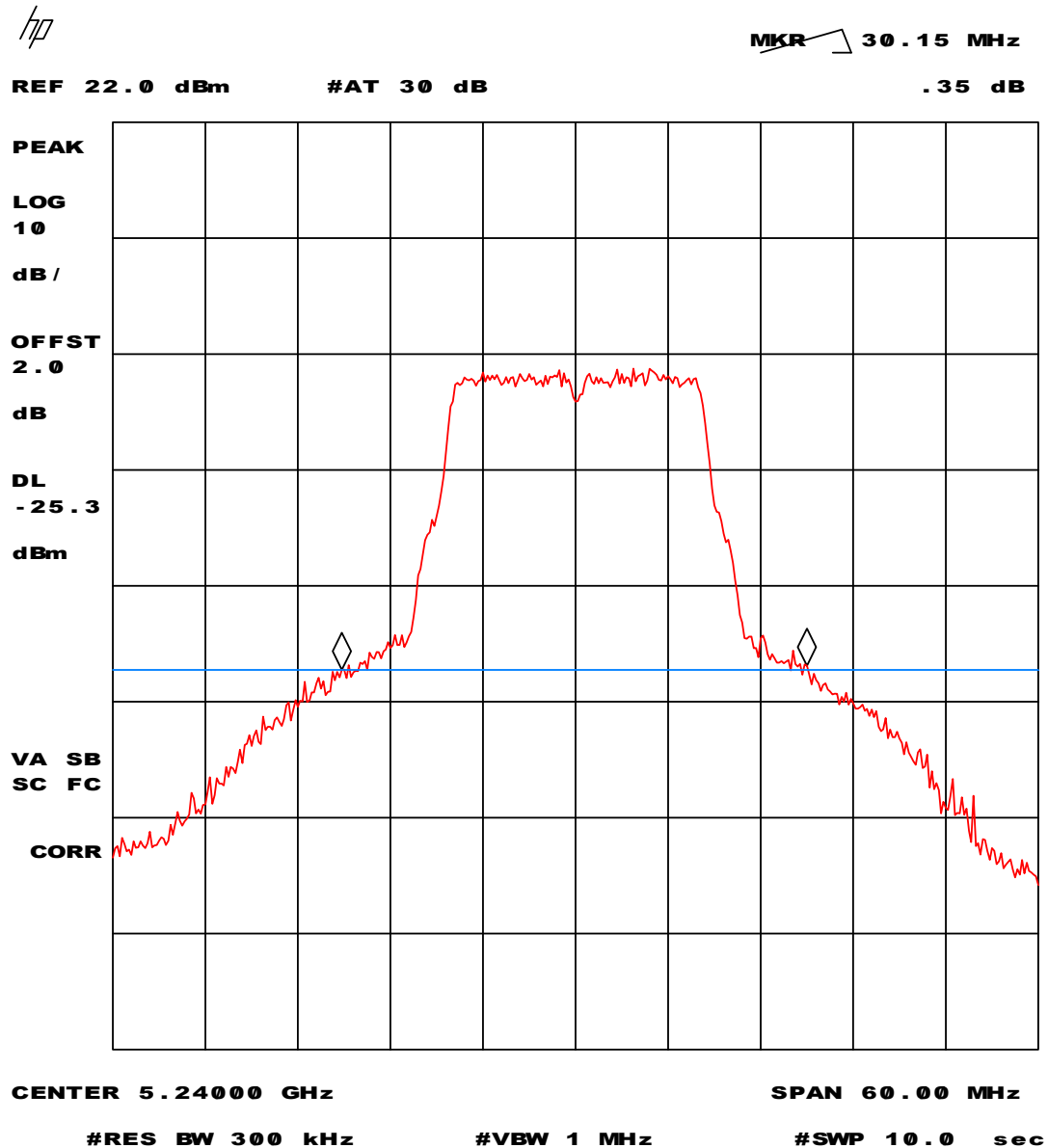
Plot 11 – Emission bandwidth (conducted, -26 dB).

Plot 11 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 2.0 dB.



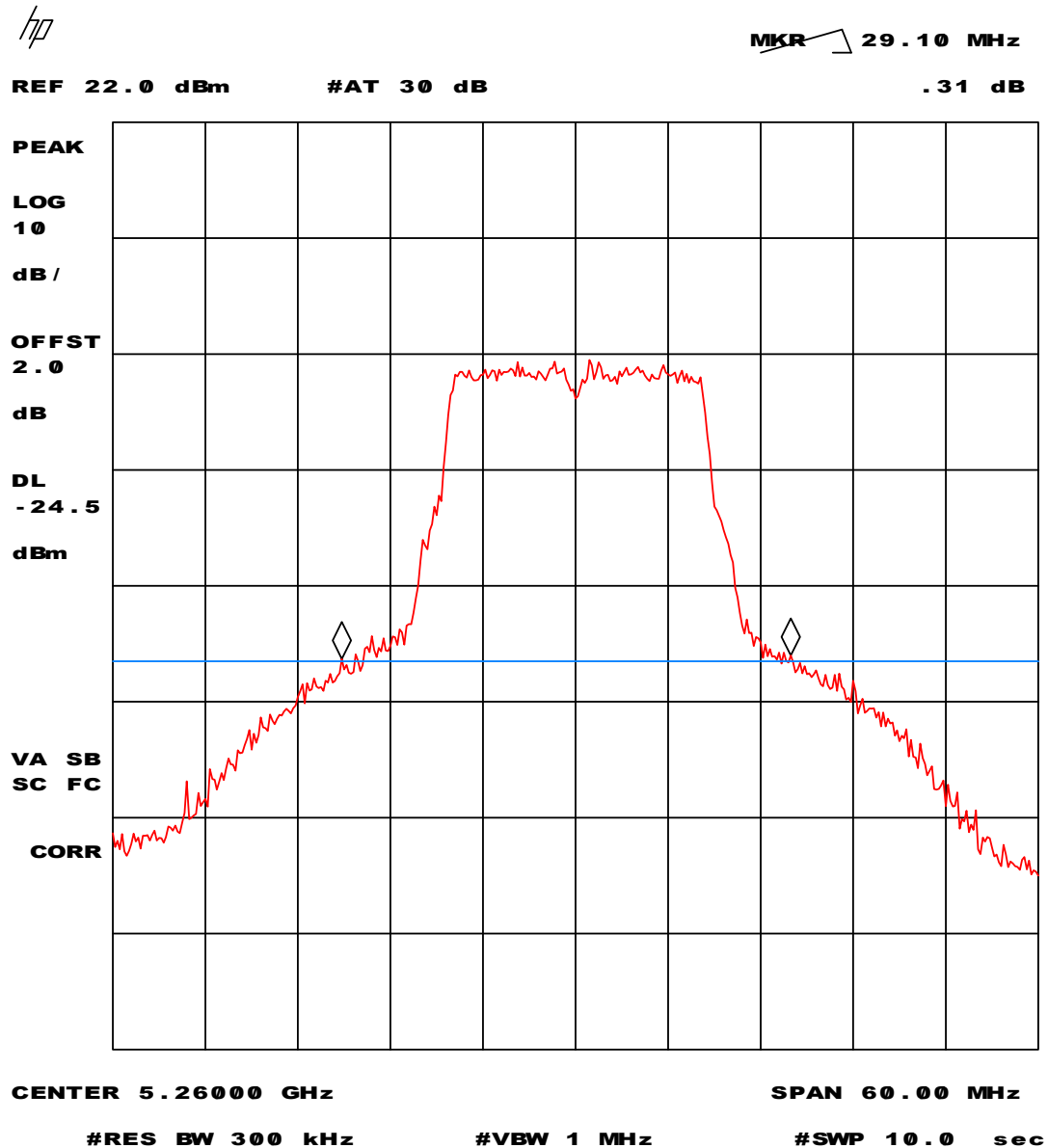
Plot 12 – Emission bandwidth (conducted, -26 dB).

Plot 12 depicts the emission bandwidth (conducted, -26 dB) 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 2.0 dB.



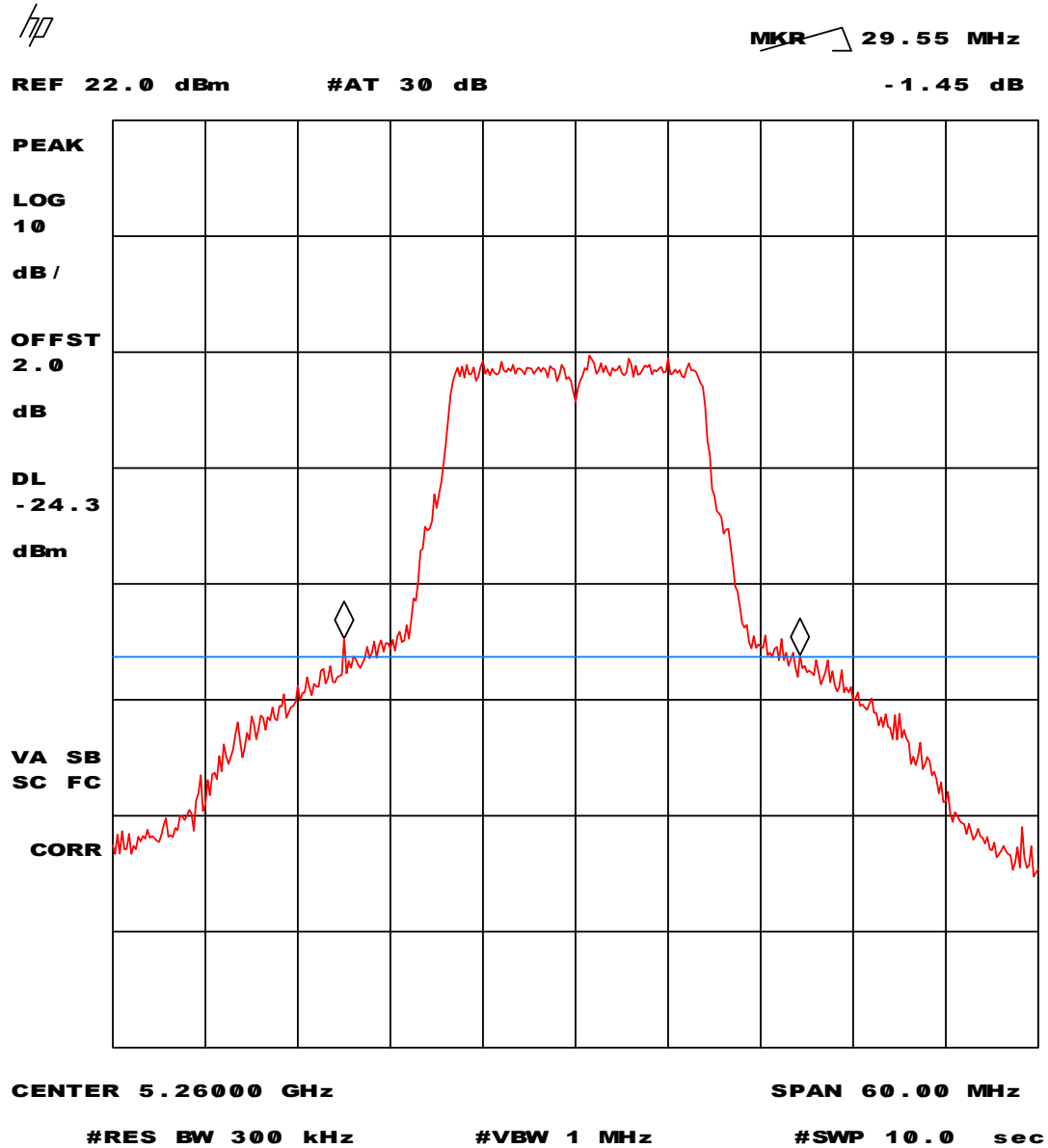
Plot 13 – Emission bandwidth (conducted, -26 dB).

Plot 13 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 2.0 dB.



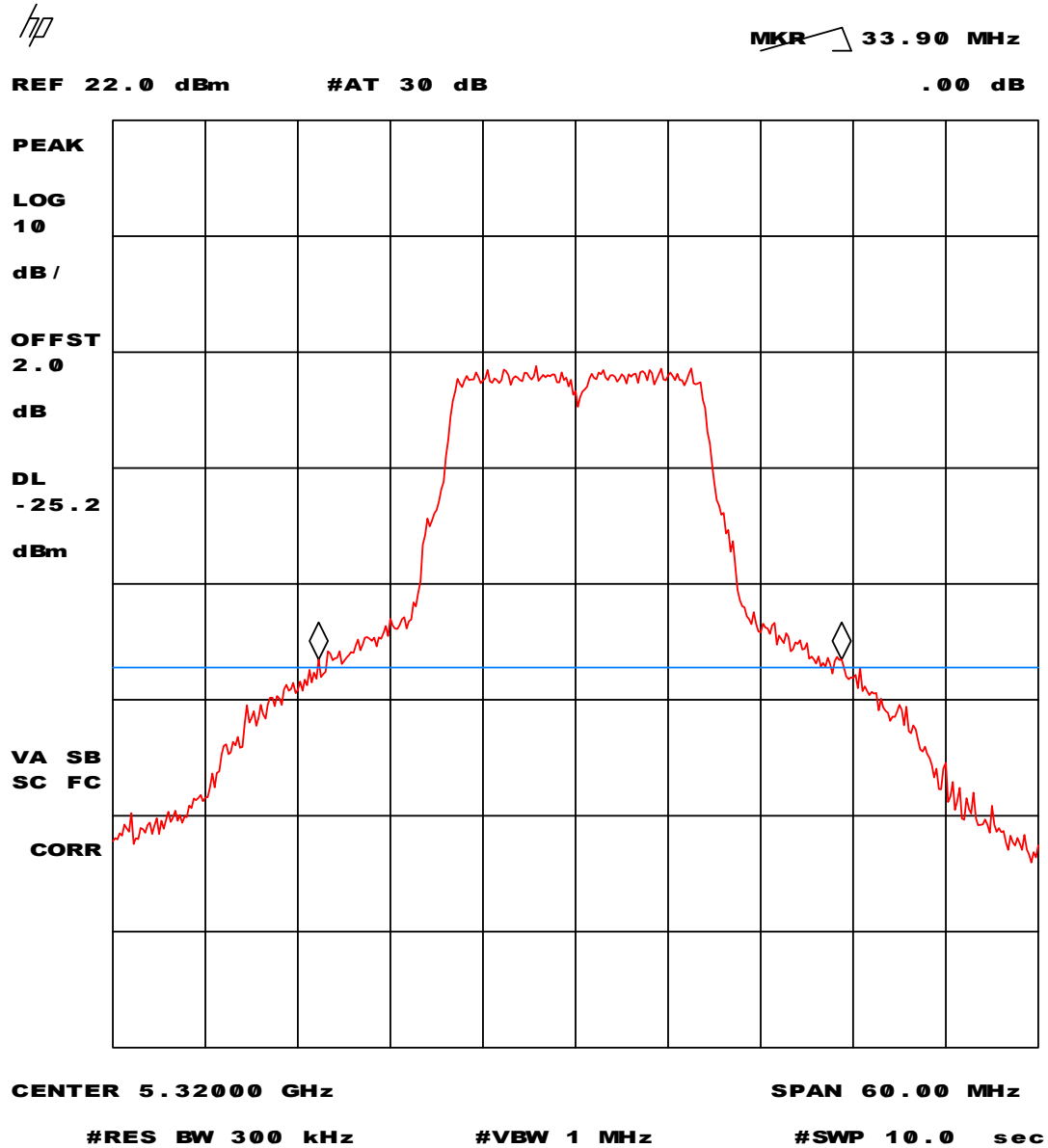
Plot 14 – Emission bandwidth (conducted, -26 dB).

Plot 14 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 2.0 dB.



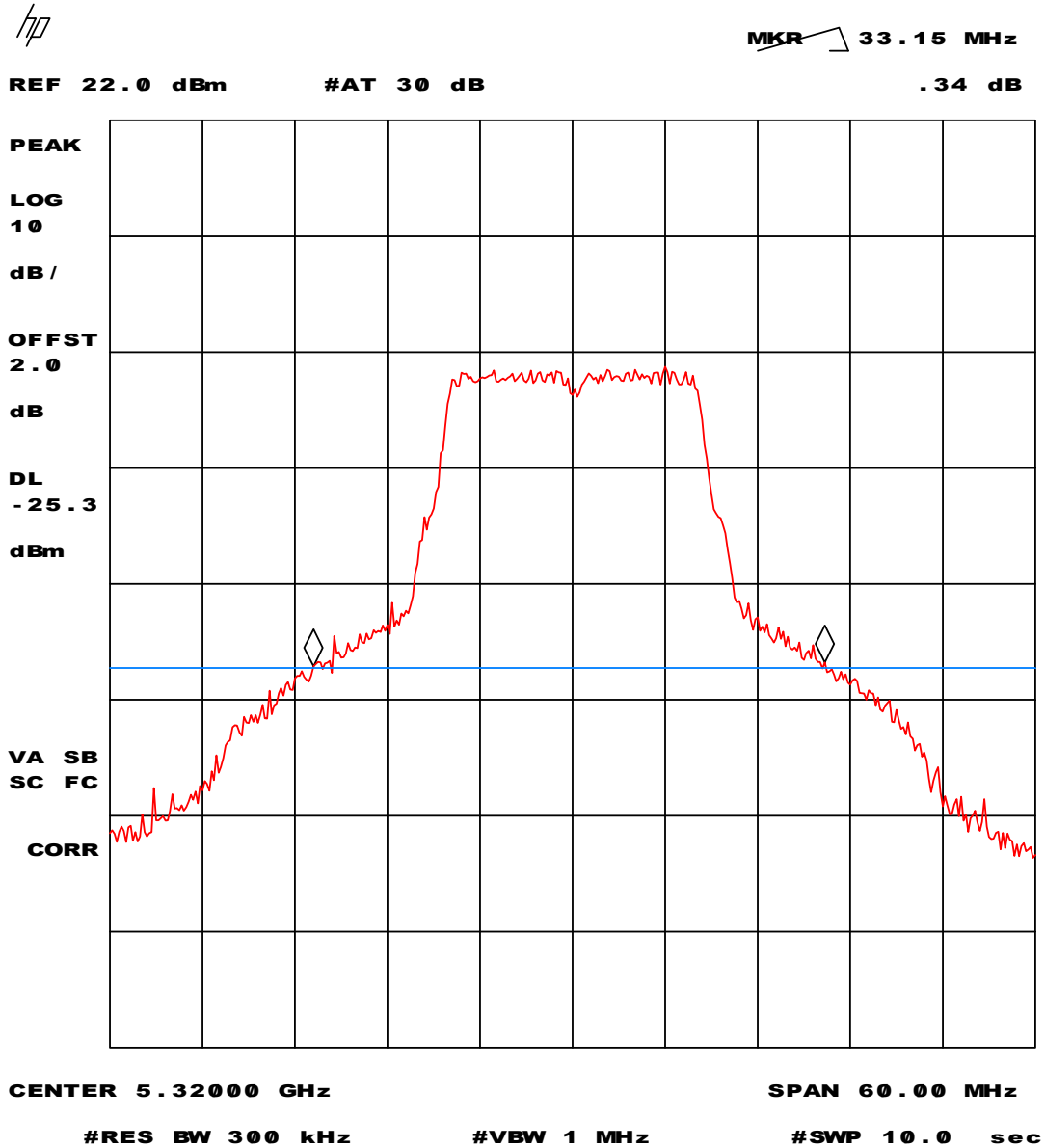
Plot 15 – Emission bandwidth (conducted, -26 dB).

Plot 15 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 2.0 dB.



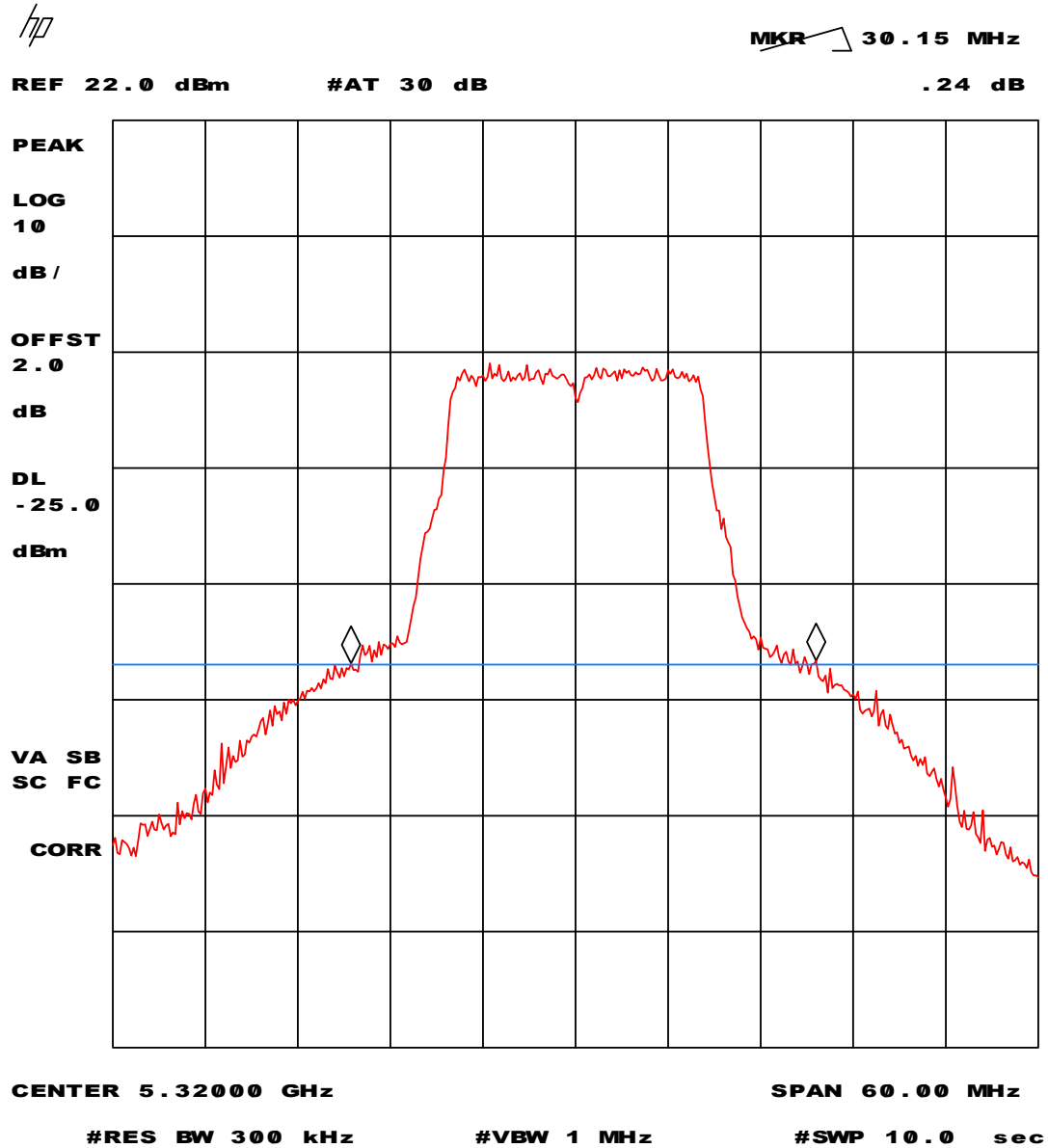
Plot 16 – Emission bandwidth (conducted, -26 dB).

Plot 16 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 2.0 dB.



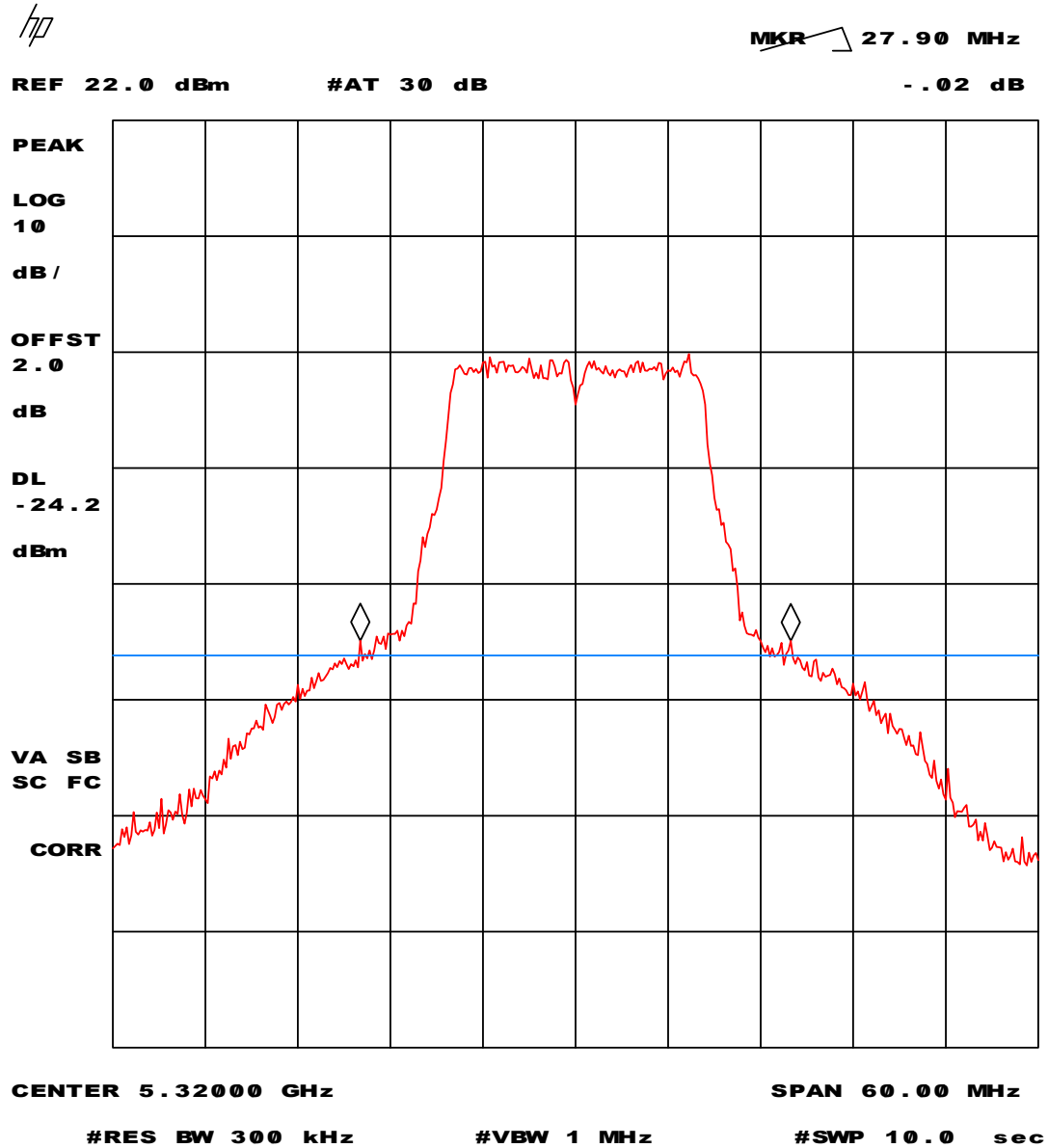
Plot 17 – Emission bandwidth (conducted, -26 dB).

Plot 17 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 2.0 dB.



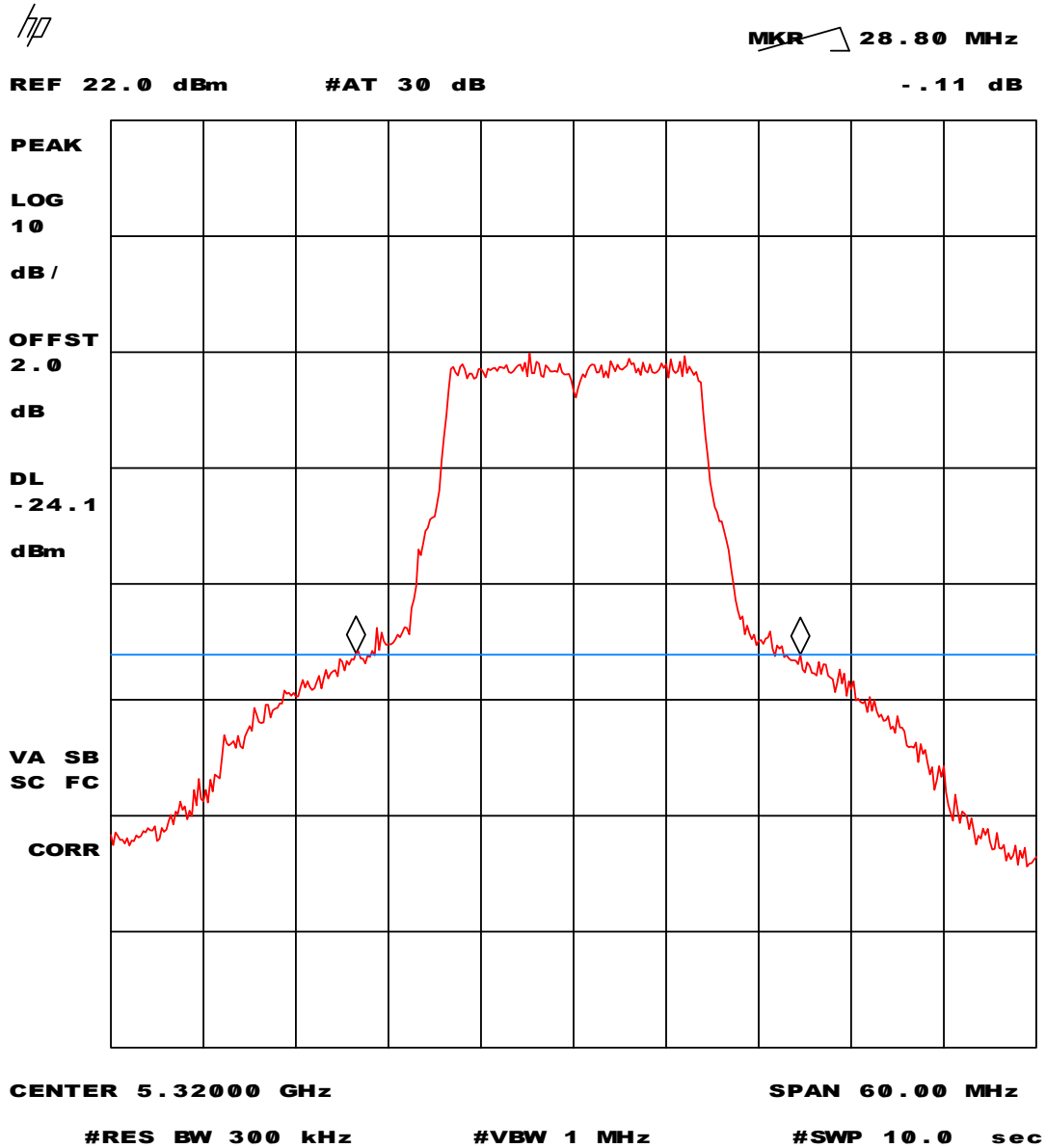
Plot 18 – Emission bandwidth (conducted, -26 dB).

Plot 18 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 2.0 dB.



Plot 19 – Emission bandwidth (conducted, -26 dB).

Plot 19 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 2.0 dB.

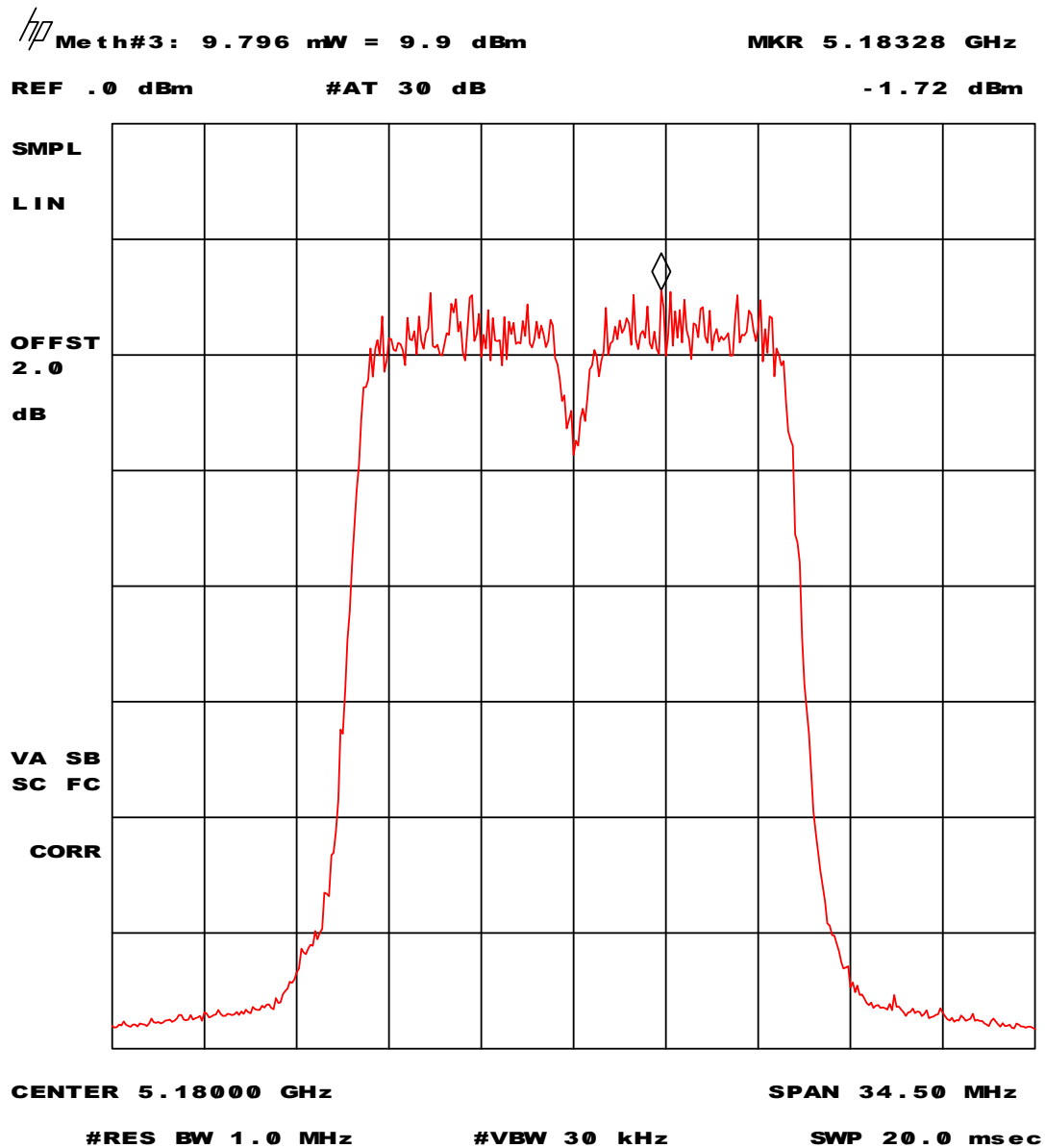


Plot 20 – Emission bandwidth (conducted, -26 dB).

Plot 20 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 2.0 dB.



## 5.2 Peak conducted transmit output power.

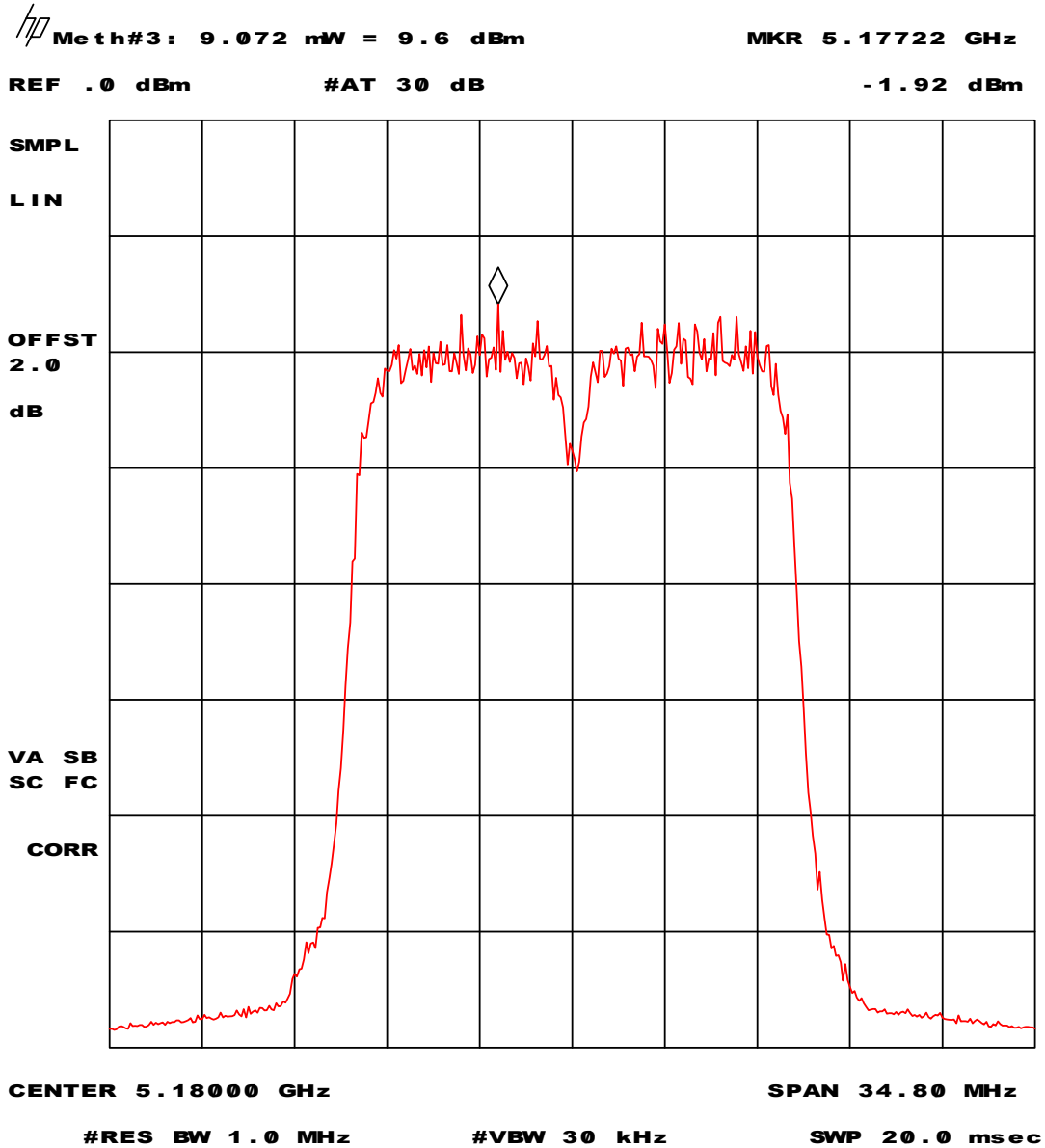


Plot 21 – Peak conducted transmit output power.

Plot 21 depicts the peak conducted transmit output power with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 6 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

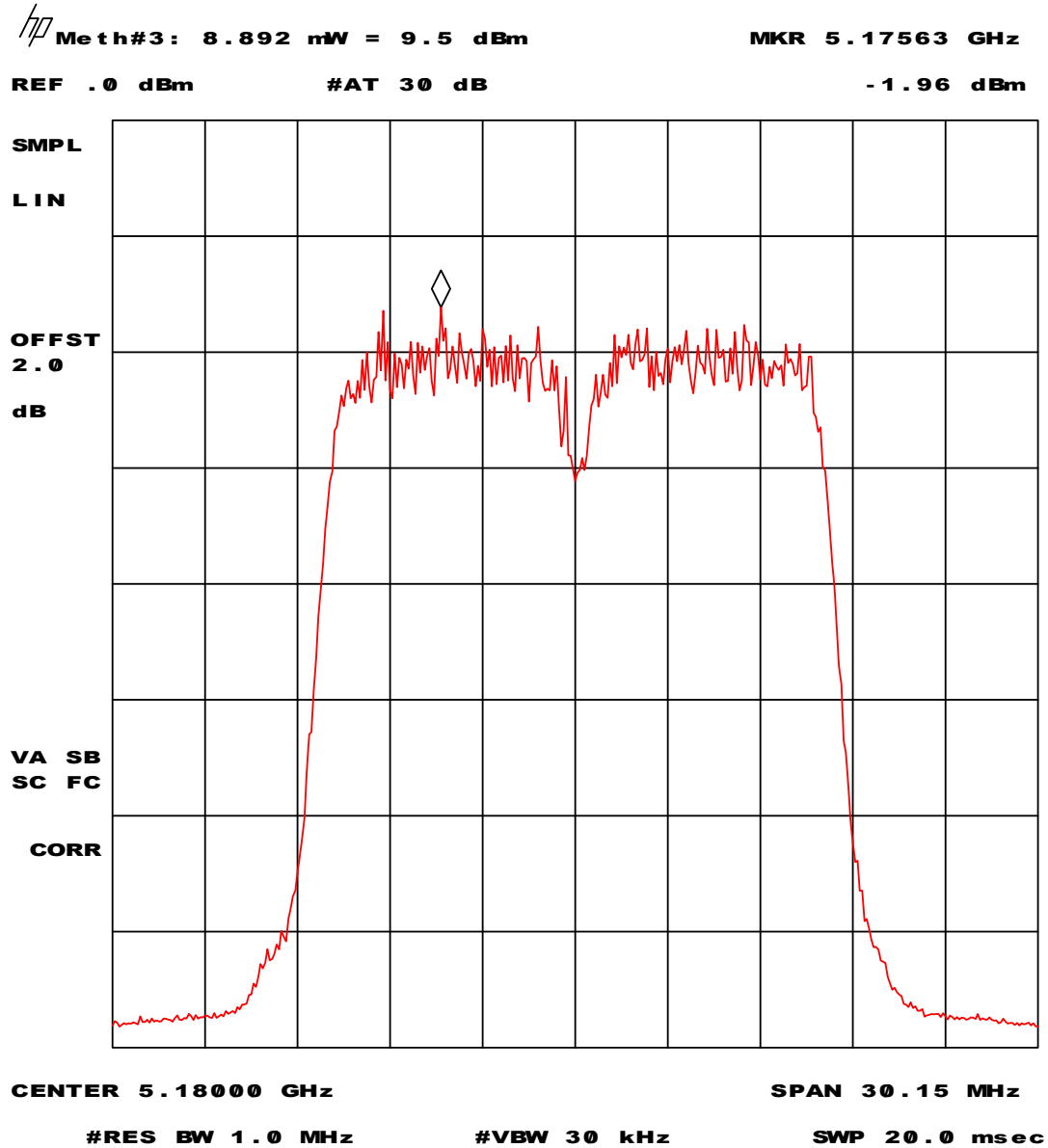


Plot 22 – Peak conducted transmit output power.

Plot 22 depicts the peak conducted transmit output power with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 9 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.

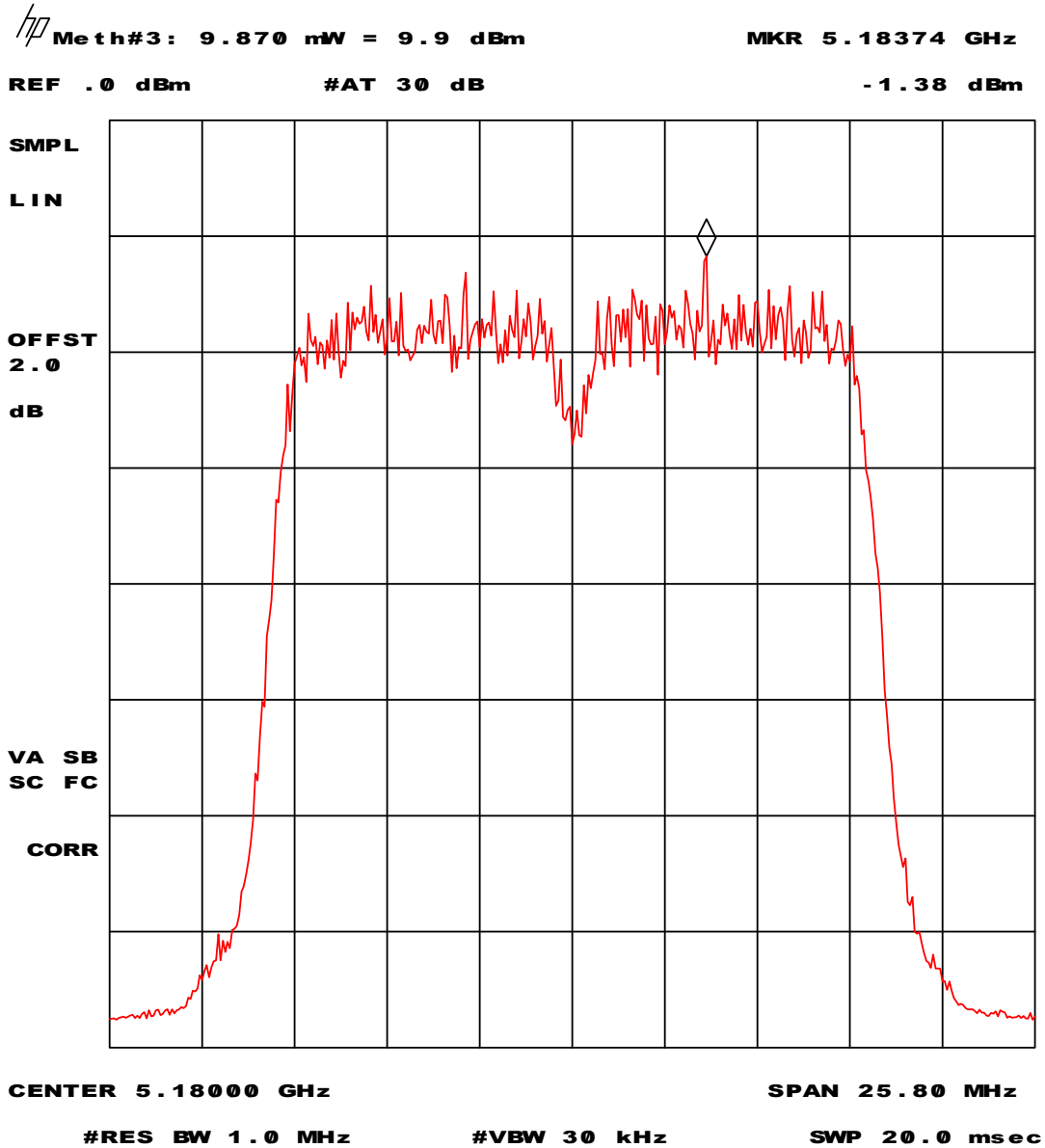


Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB



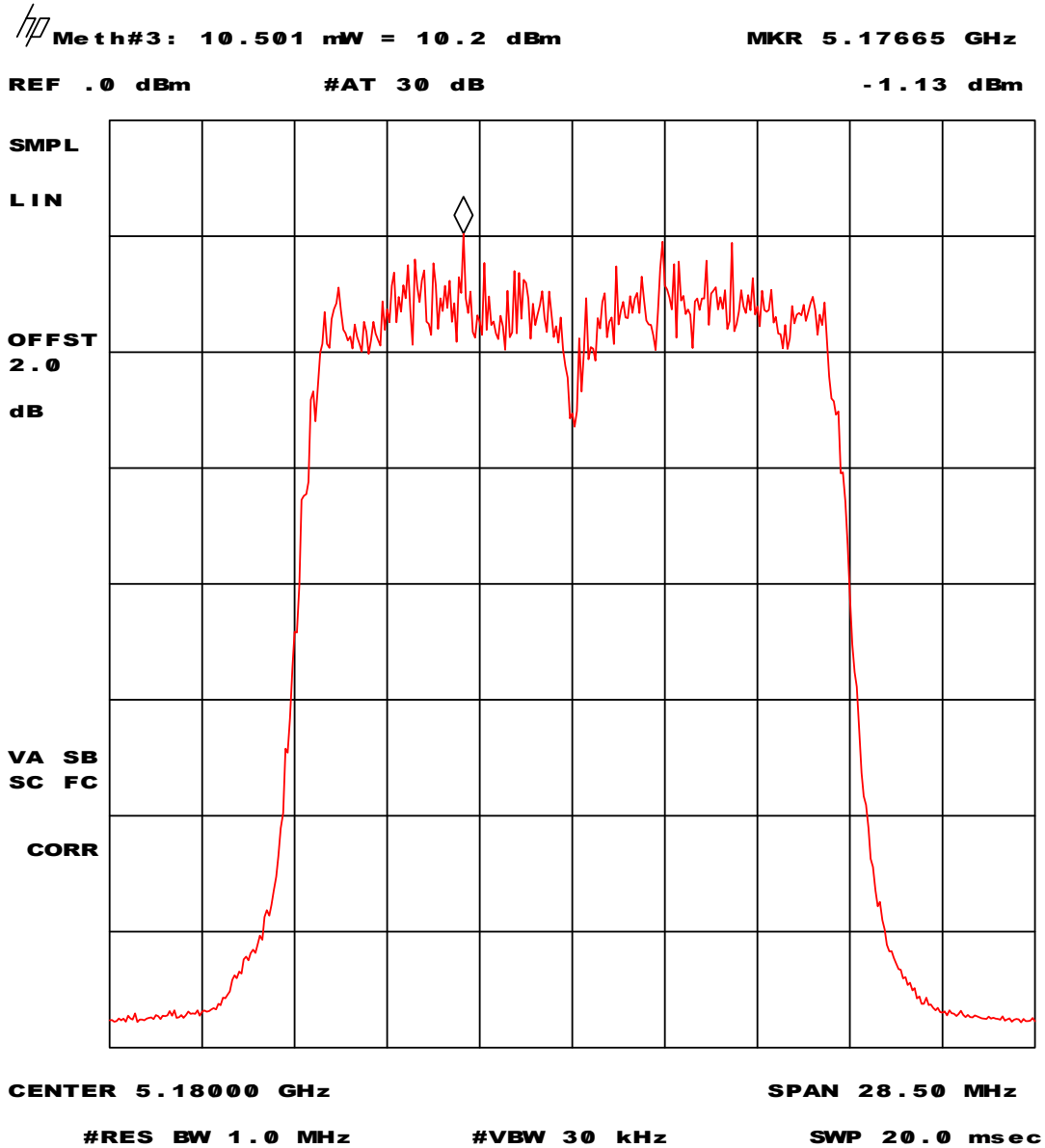
Plot 23 – Peak conducted transmit output power.

Plot 23 depicts the peak conducted transmit output power with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 18 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



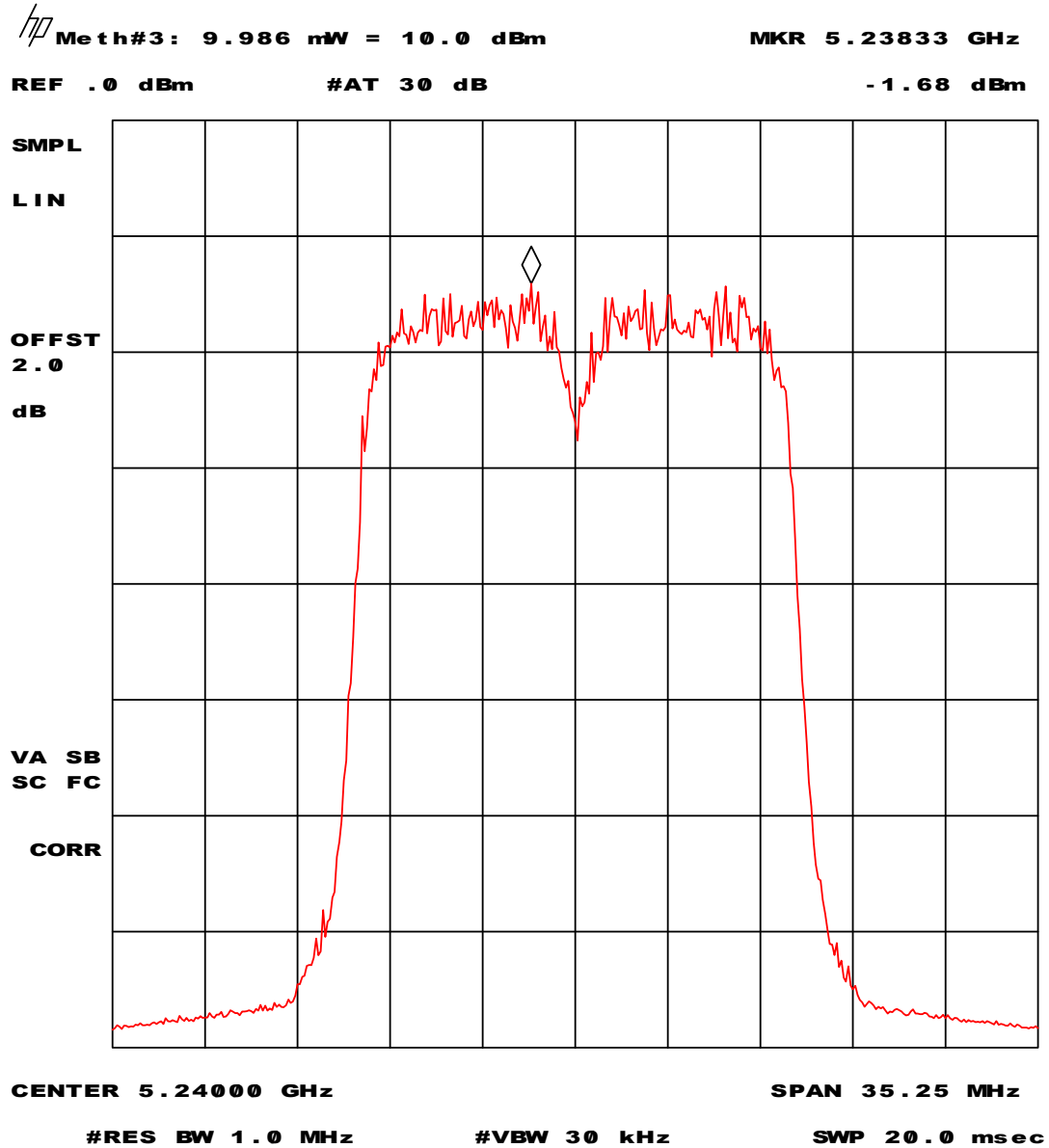
Plot 24 – Peak conducted transmit output power.

Plot 24 depicts the peak conducted transmit output power with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 36 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



Plot 25 – Peak conducted transmit output power.

Plot 25 depicts the peak conducted transmit output power with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 54 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.

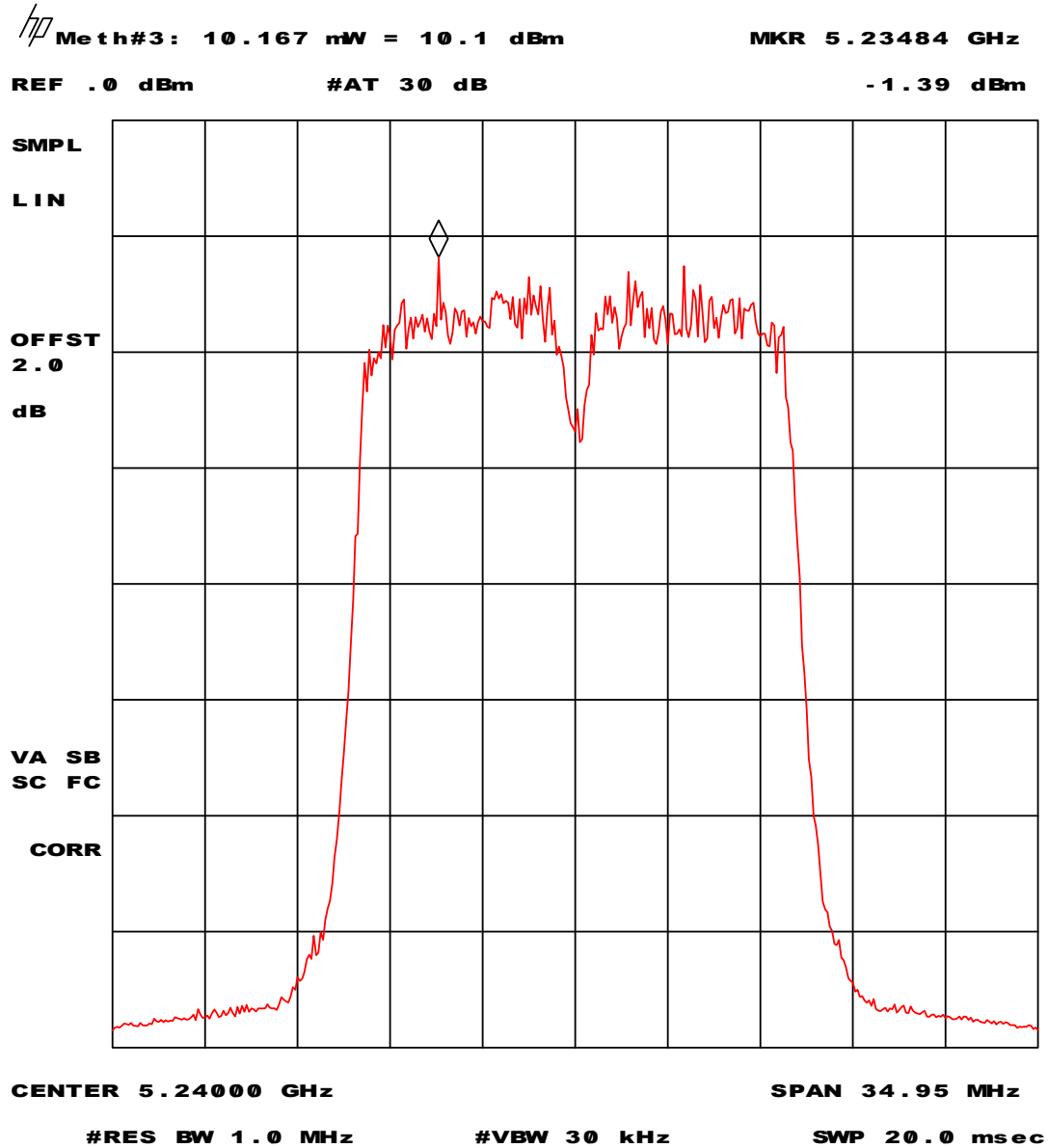


Plot 26 – Peak conducted transmit output power.

Plot 26 depicts the peak conducted transmit output power with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 6 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.

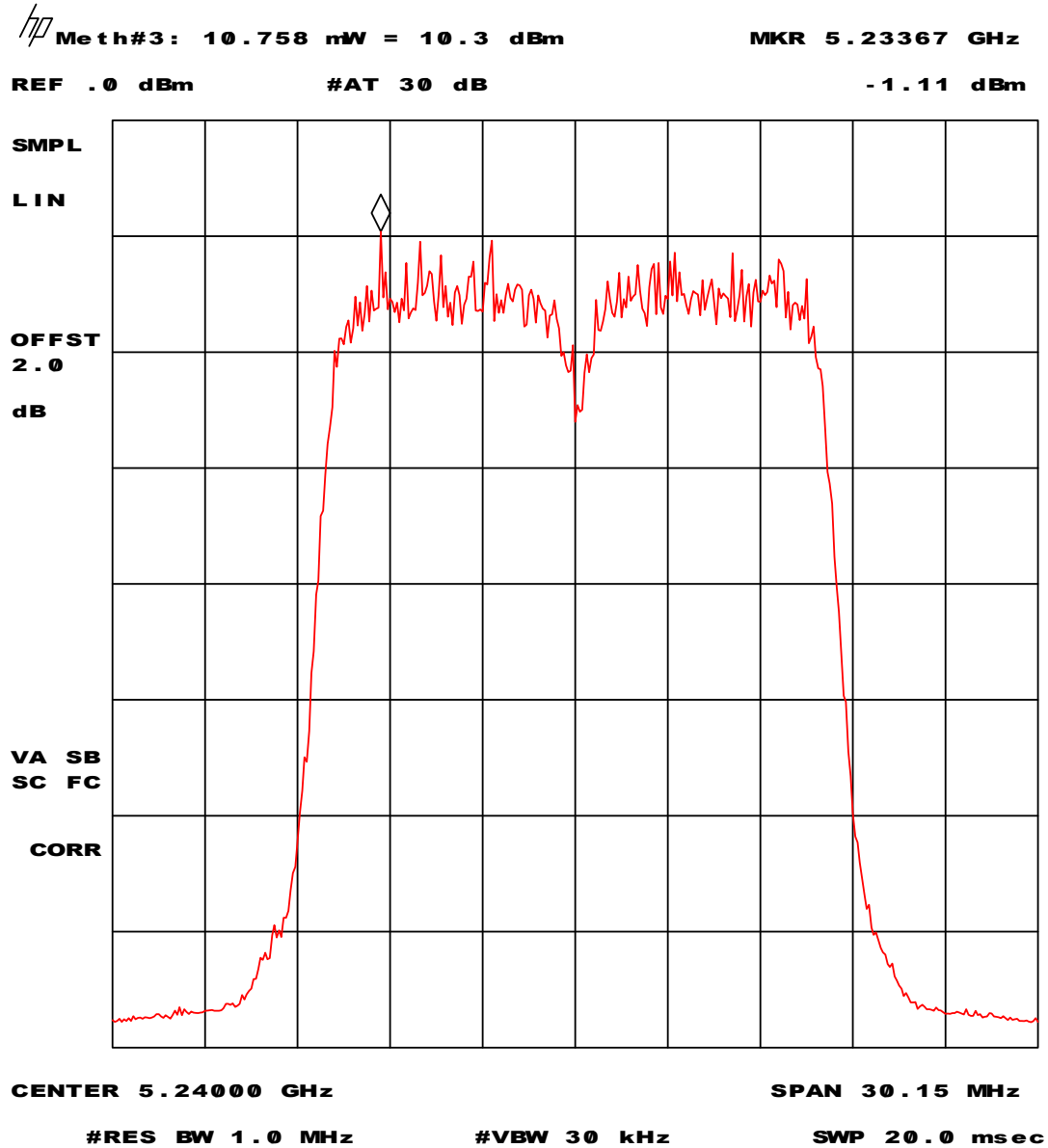


Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB



Plot 27 – Peak conducted transmit output power.

Plot 27 depicts the peak conducted transmit output power with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 9 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.

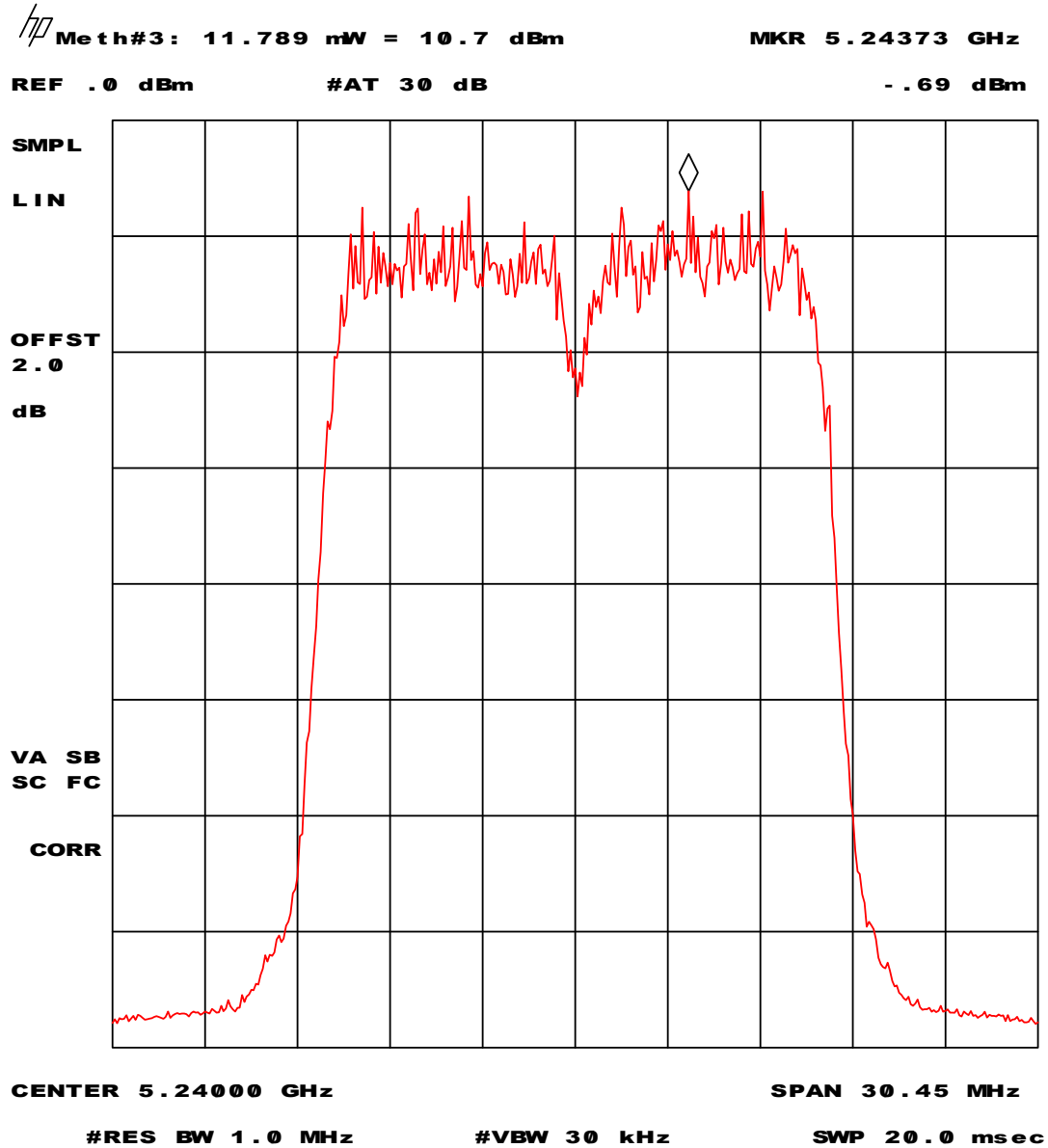


Plot 28 – Peak conducted transmit output power.

Plot 28 depicts the peak conducted transmit output power with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 18 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

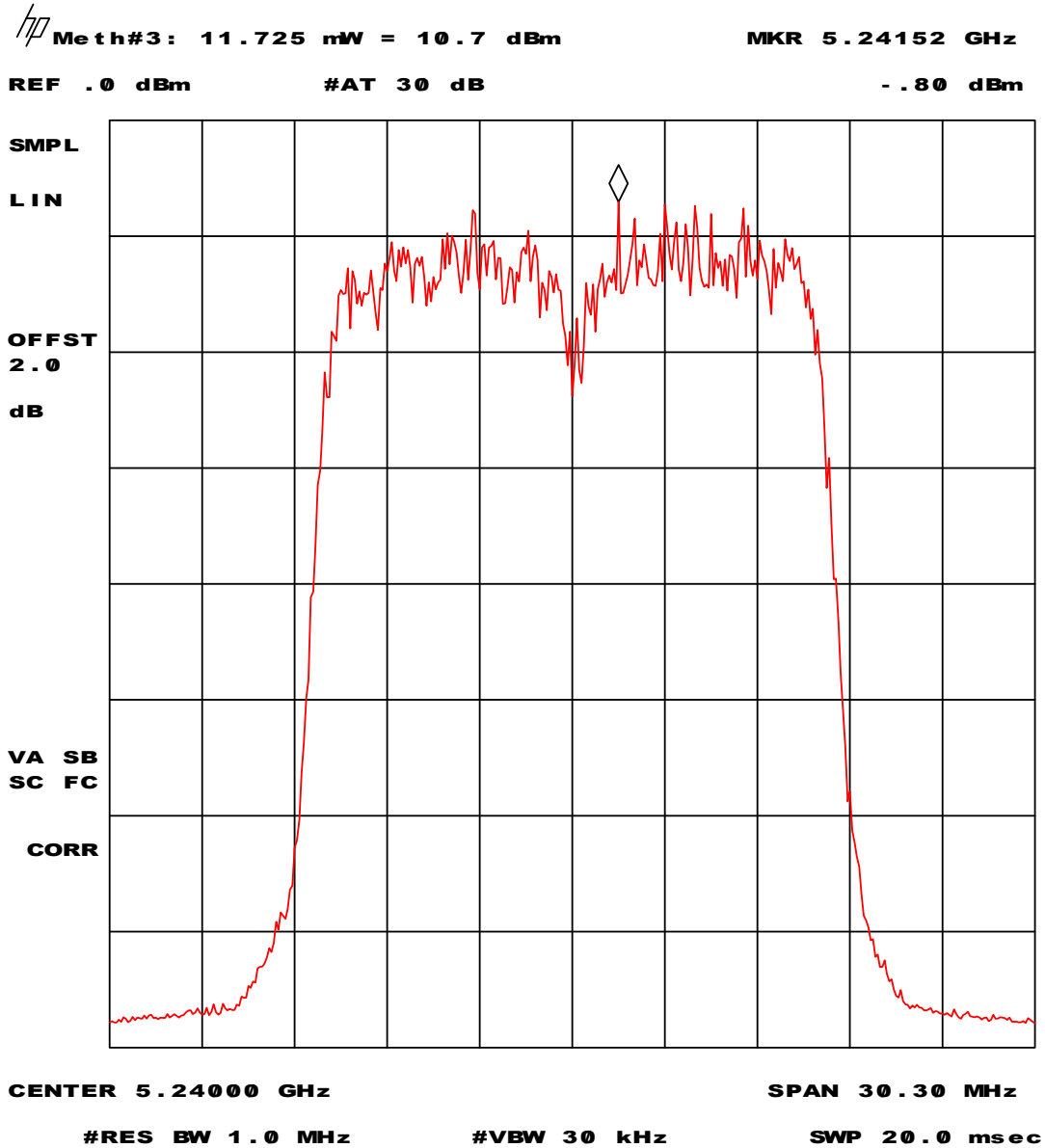


Plot 29 – Peak conducted transmit output power.

Plot 29 depicts the peak conducted transmit output power with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 36 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

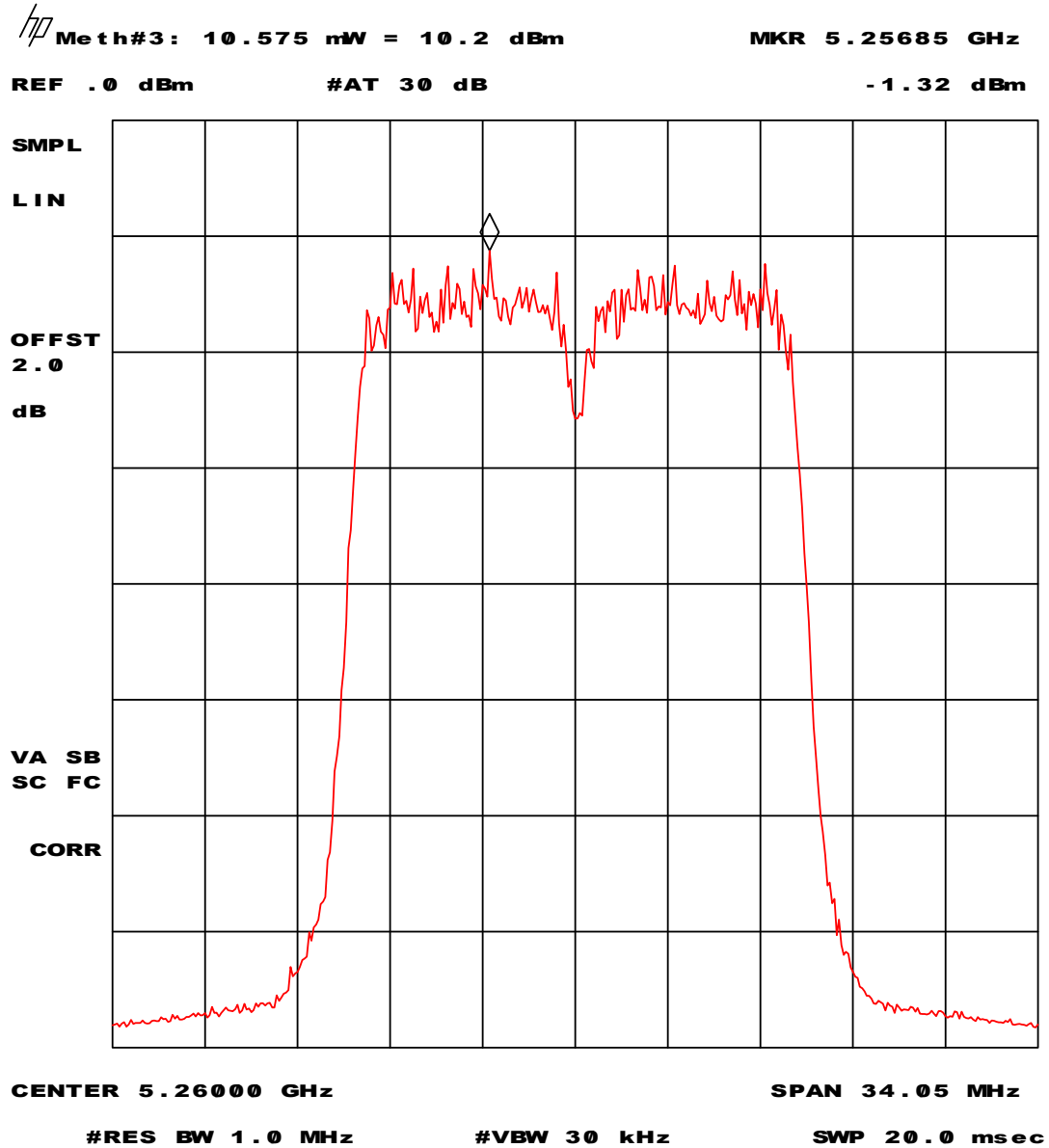


Plot 30 – Peak conducted transmit output power.

Plot 30 depicts the peak conducted transmit output power with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 54 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

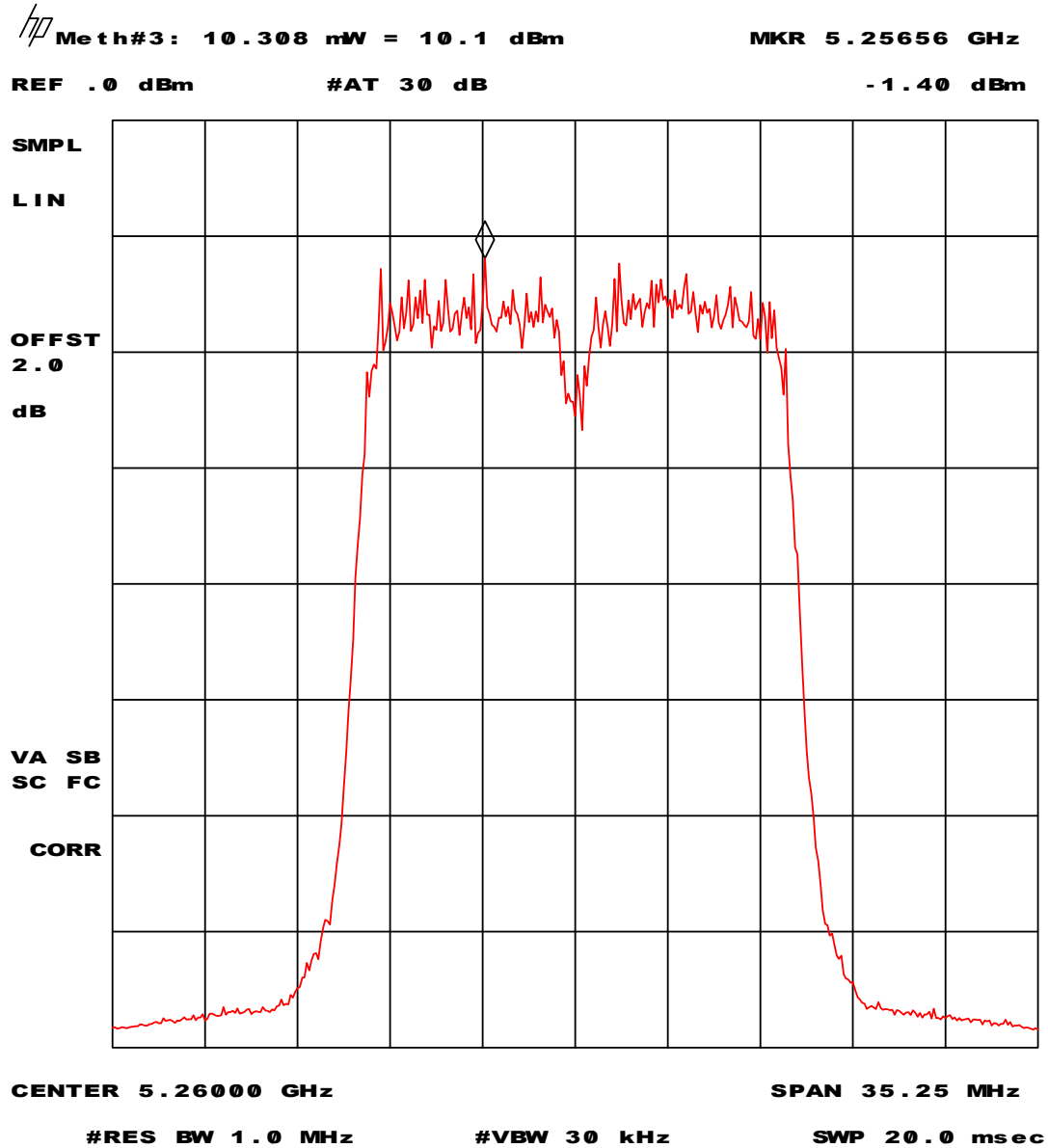


Plot 31 – Peak conducted transmit output power.

Plot 31 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 2.0 dB.

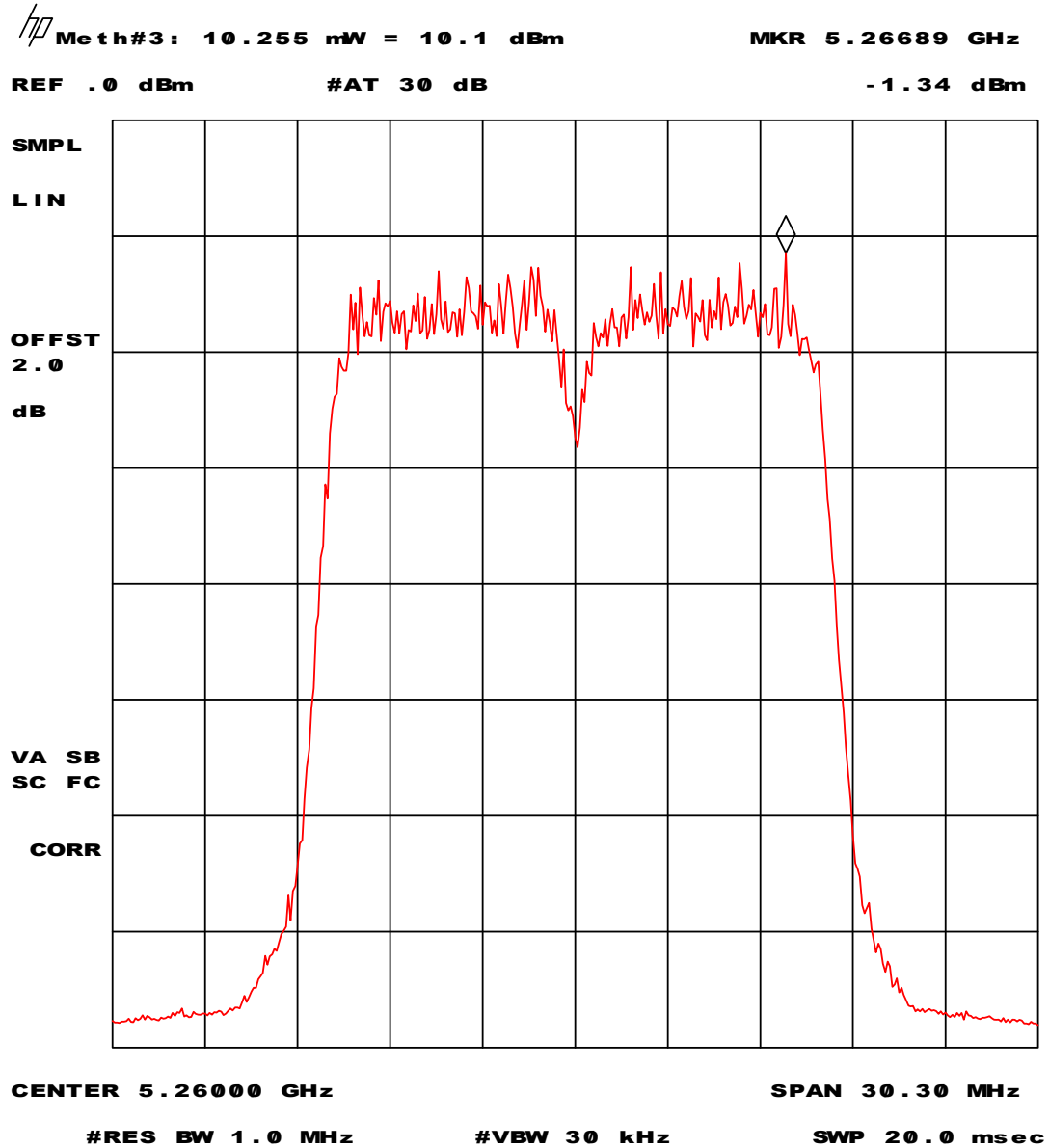


Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB



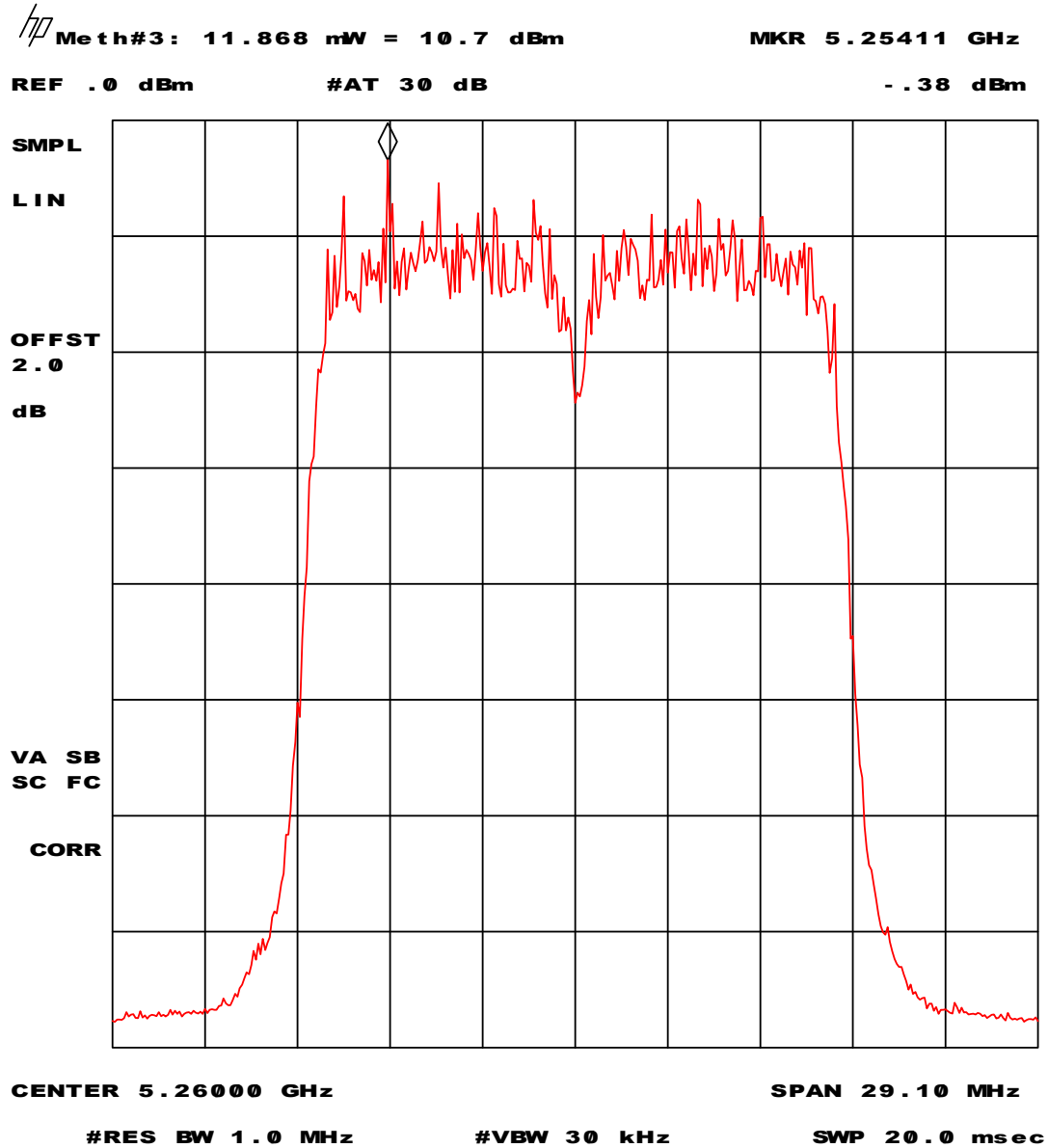
Plot 32 – Peak conducted transmit output power.

Plot 32 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 2.0 dB.



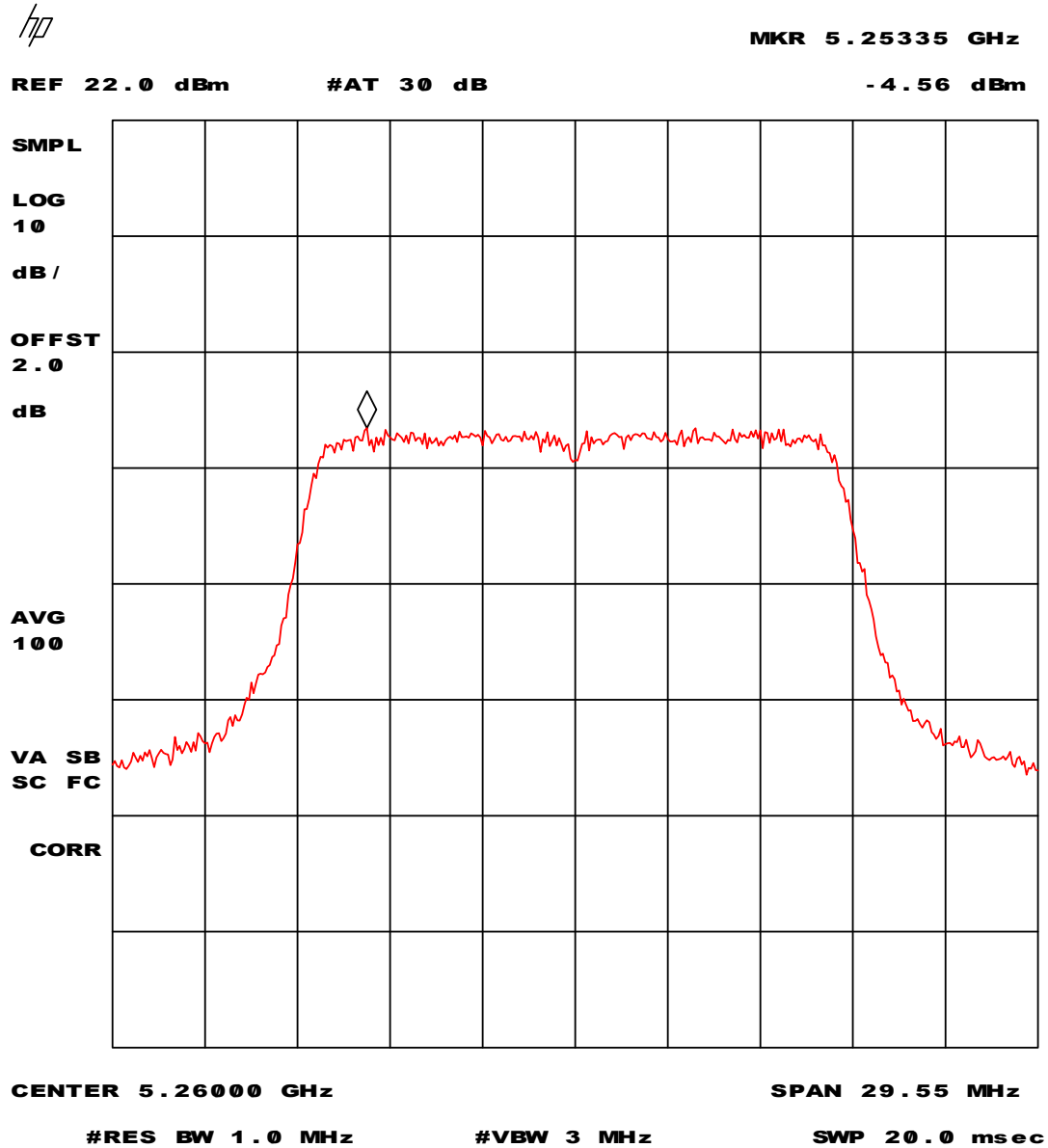
Plot 33 – Peak conducted transmit output power.

Plot 33 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 2.0 dB.



Plot 34 – Peak conducted transmit output power.

Plot 34 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 2.0 dB.

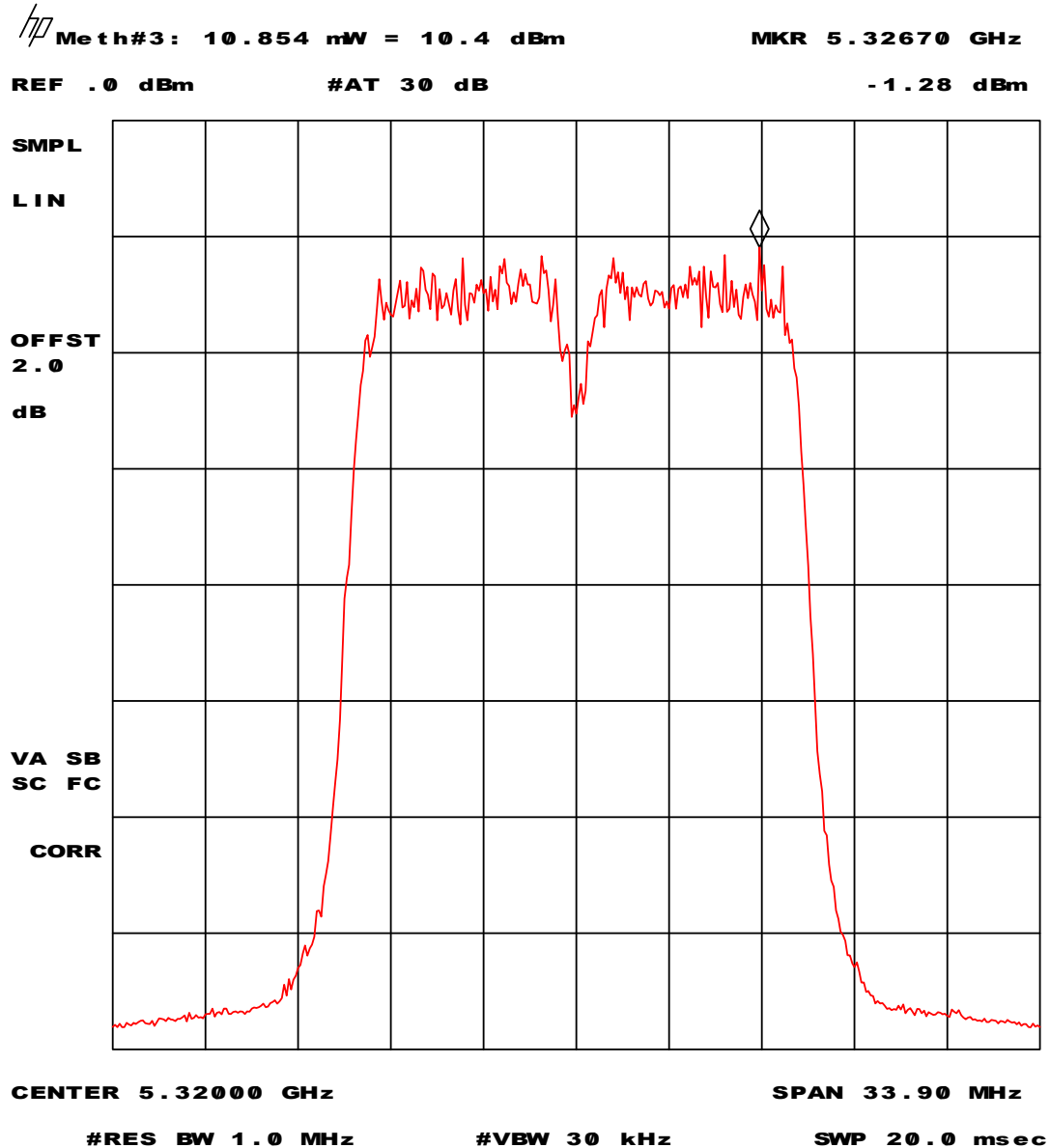


Plot 35 – Peak conducted transmit output power.

Plot 35 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 2.0 dB.



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

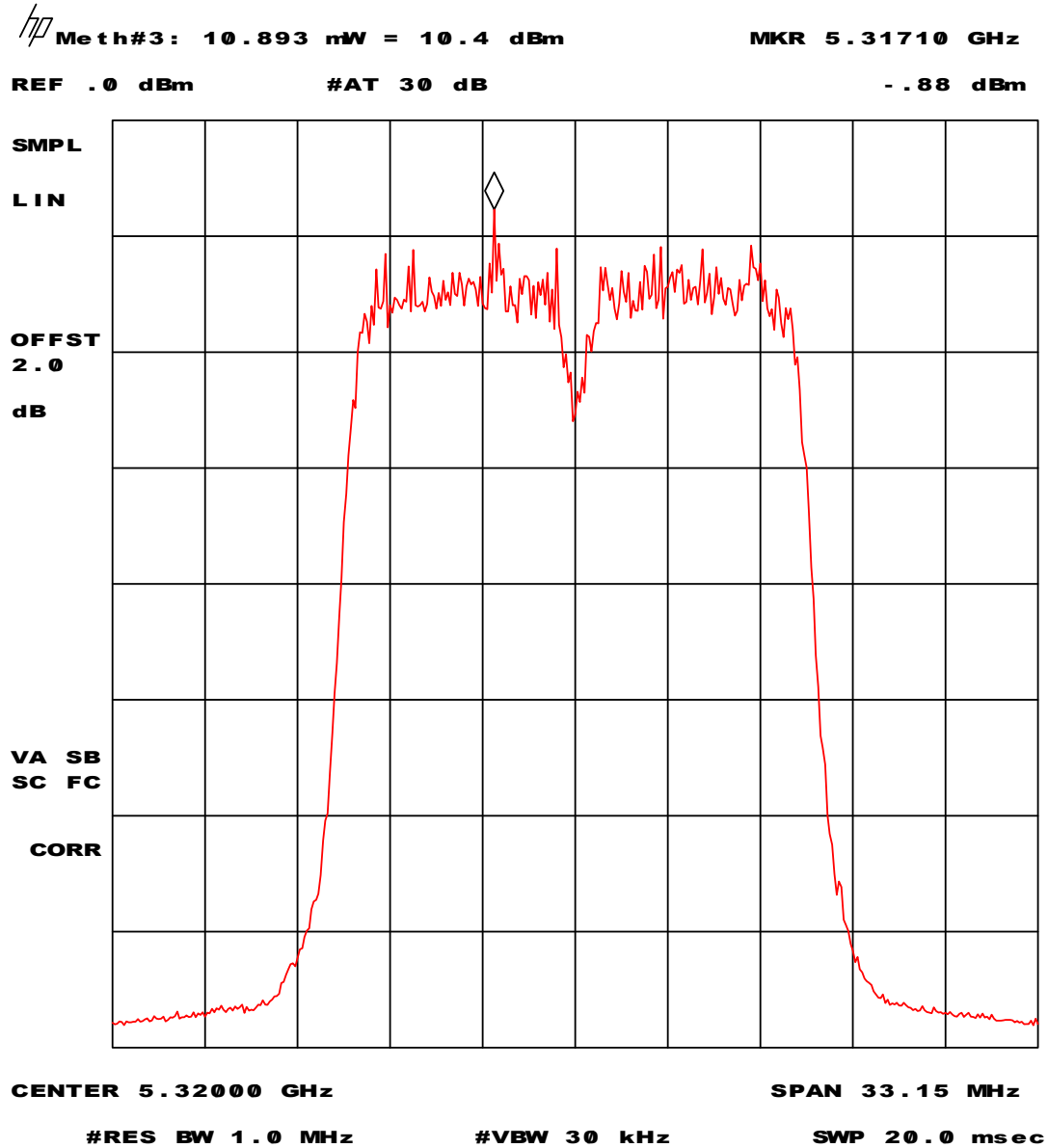


Plot 36 – Peak conducted transmit output power.

Plot 36 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 2.0 dB.

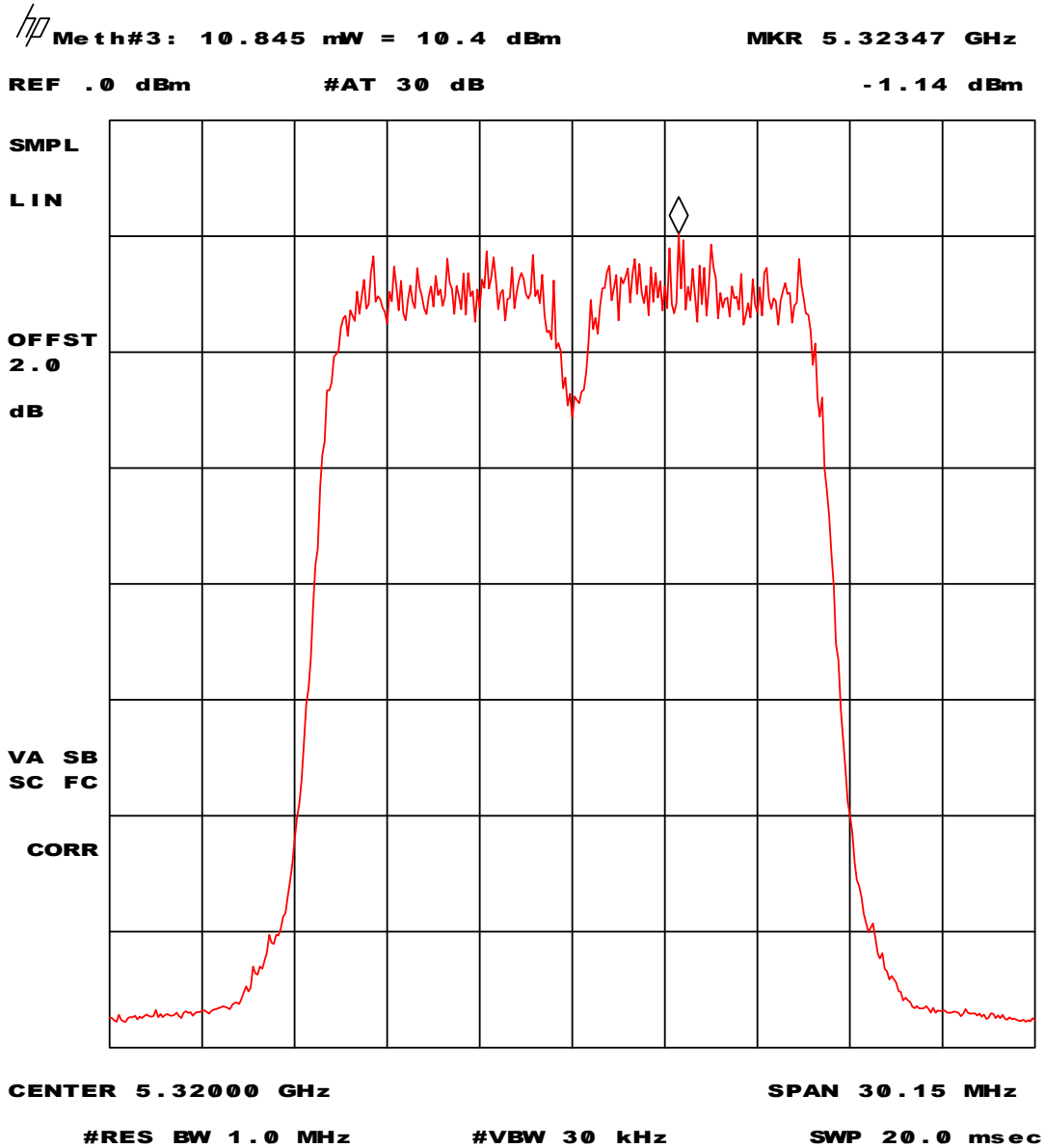


Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB



Plot 37 – Peak conducted transmit output power.

Plot 37 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 2.0 dB.

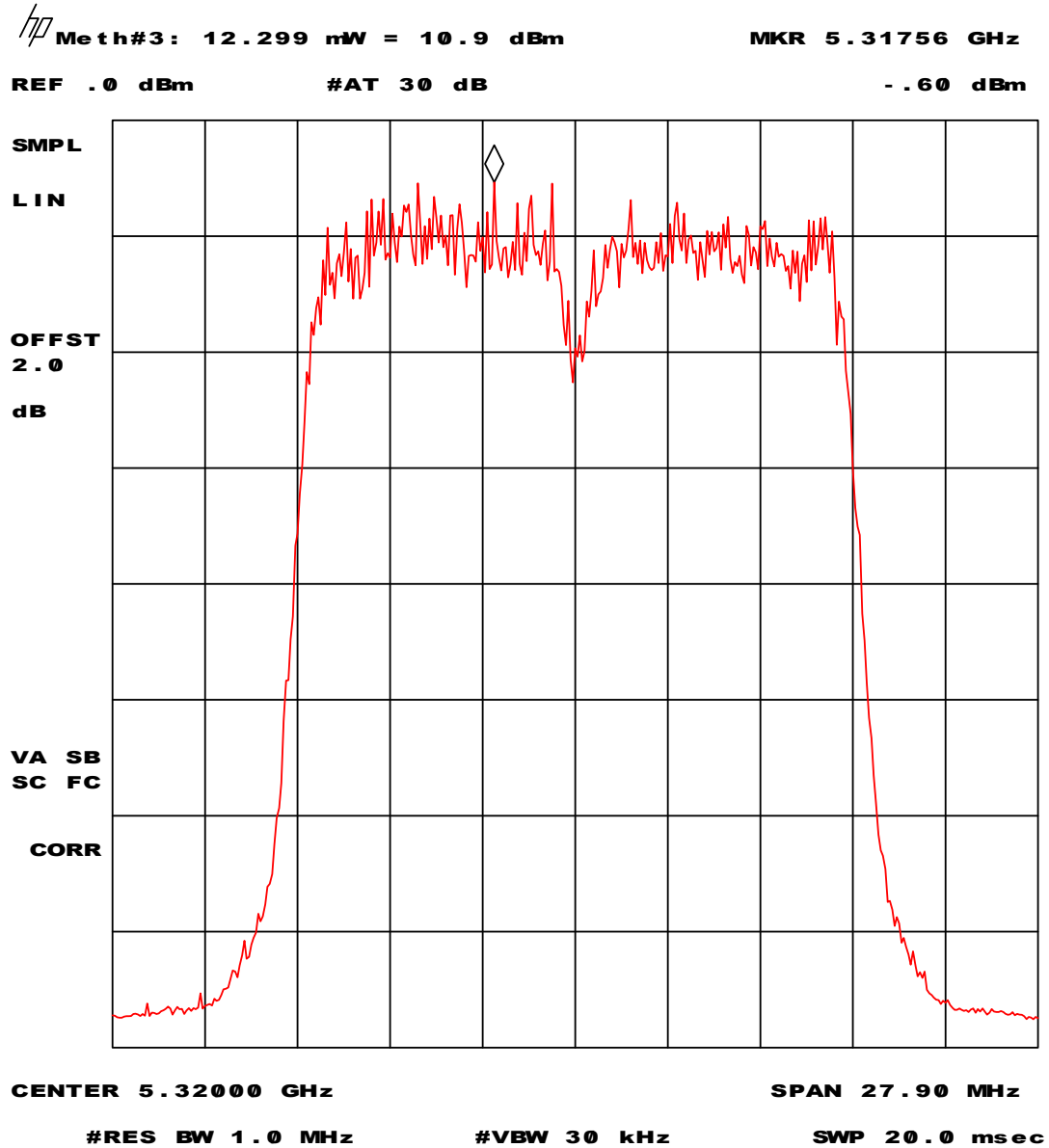


Plot 38 – Peak conducted transmit output power.

Plot 38 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 2.0 dB.

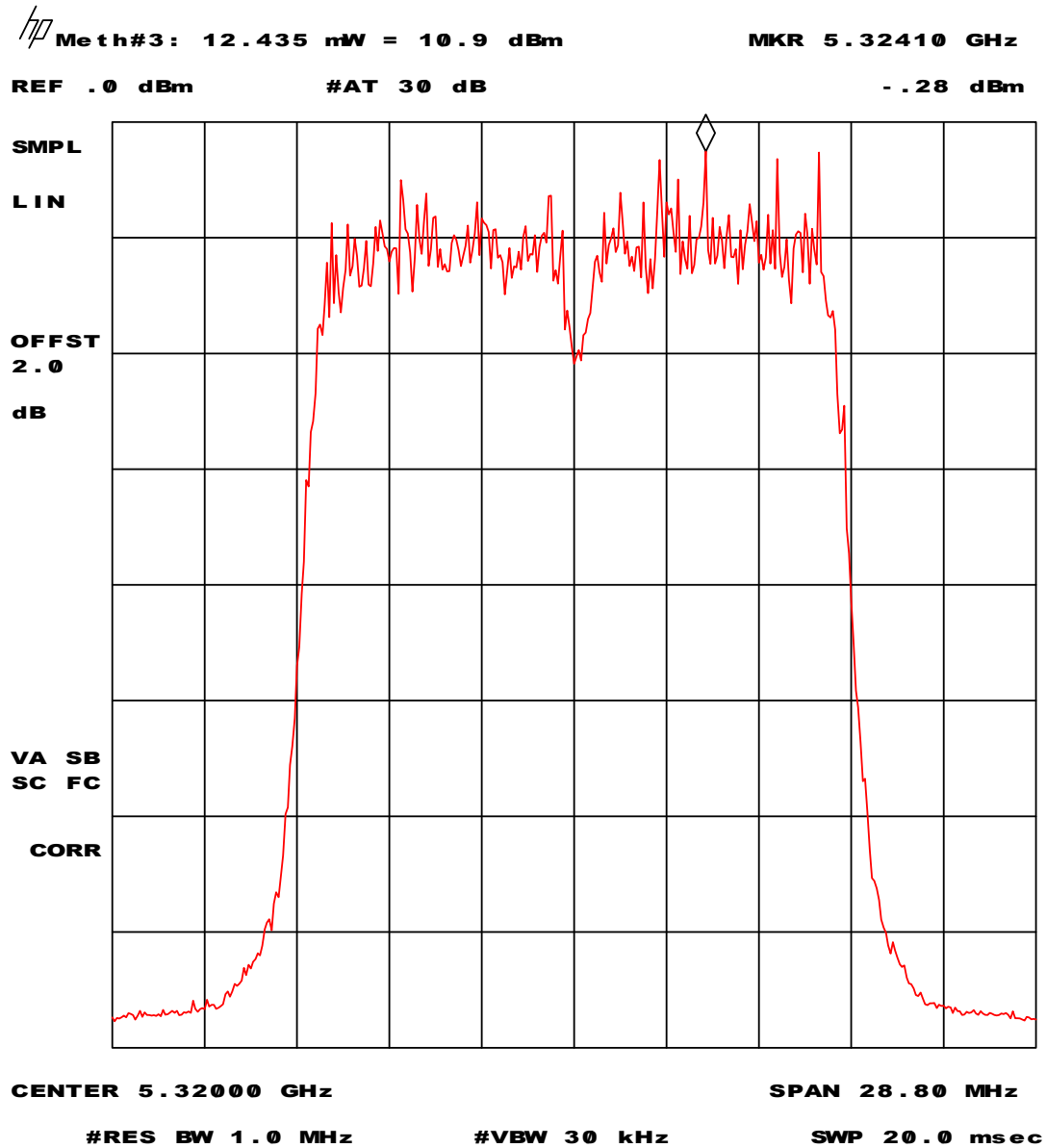


Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB



Plot 39 – Peak conducted transmit output power.

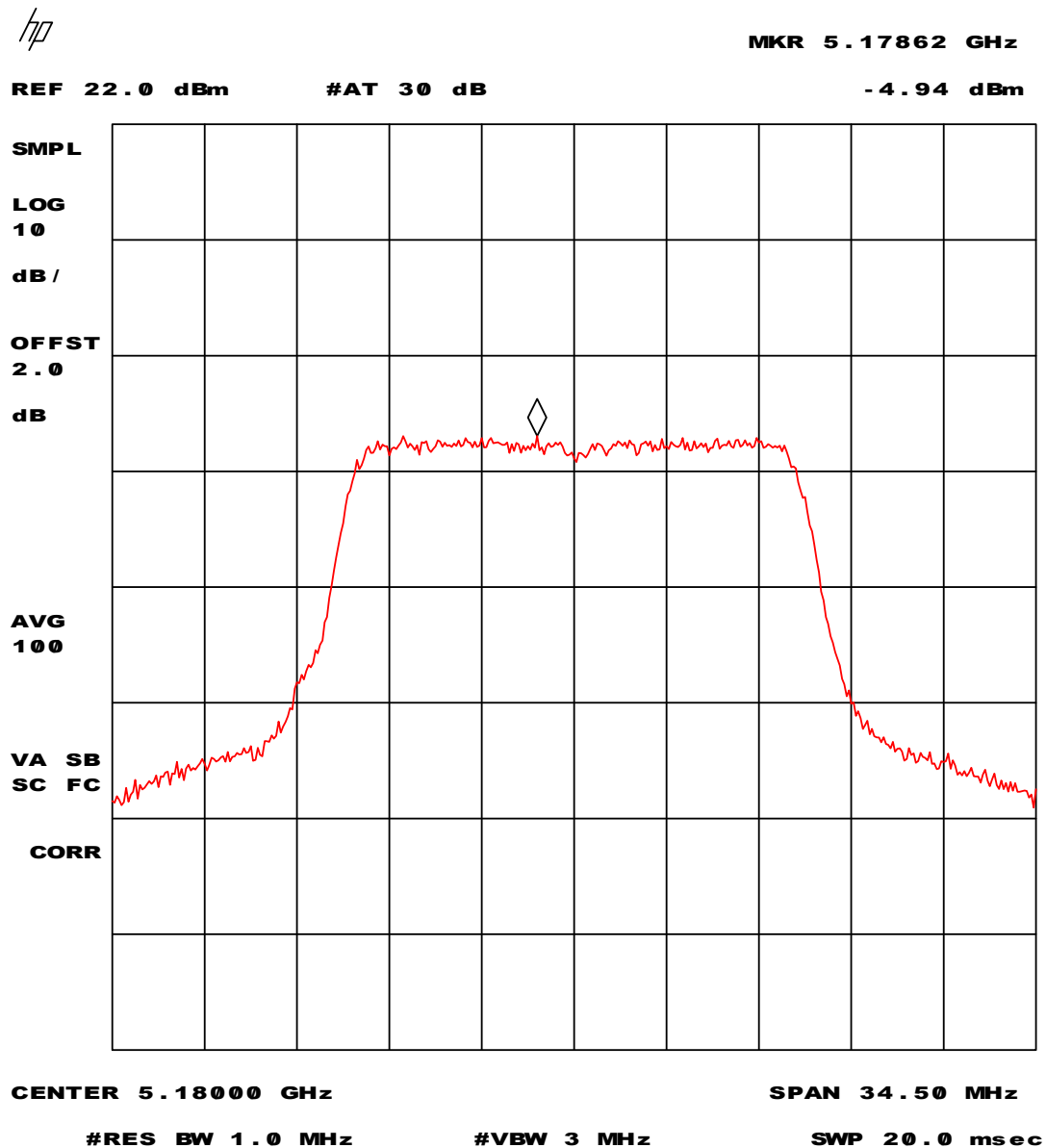
Plot 39 depicts the peak conducted transmit output power with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 36 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



Plot 40 – Peak conducted transmit output power.

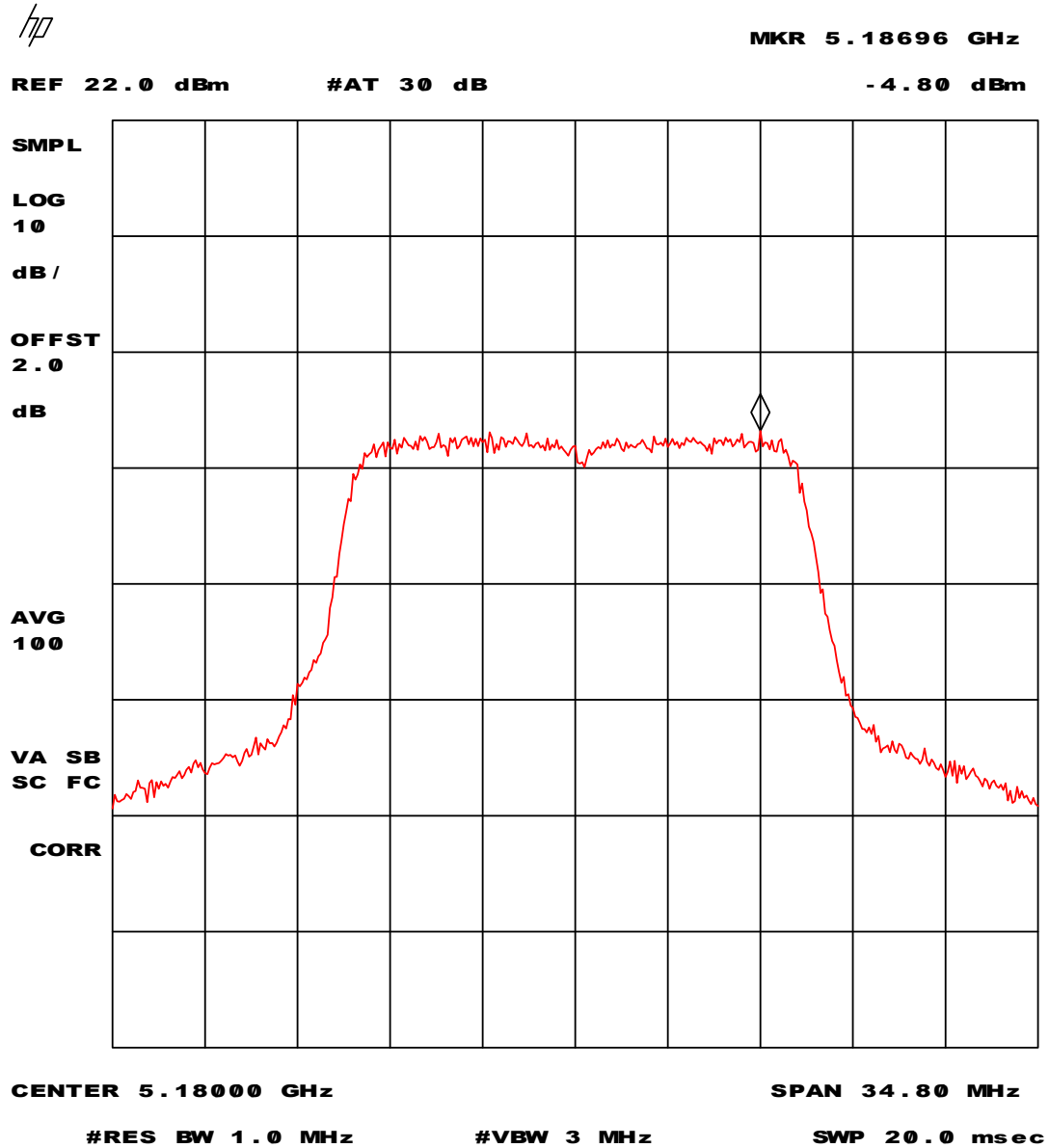
Plot 40 depicts the peak conducted transmit output power with the EUT operating on channel 64 (5320 MHz) and at a transmission bit-rate of 54 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.

### 5.3 Peak power spectral density.



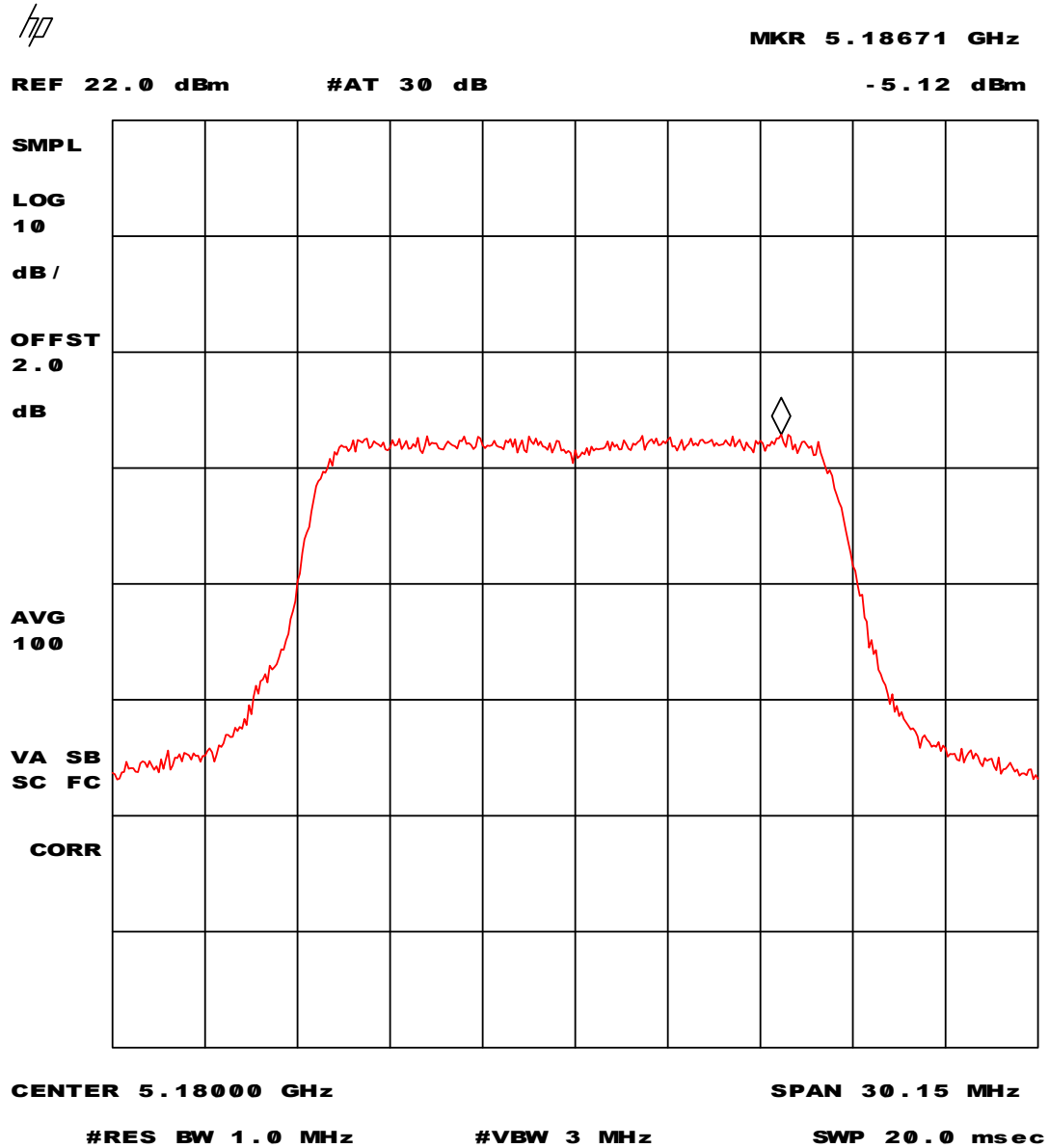
Plot 41 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 41 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 6 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



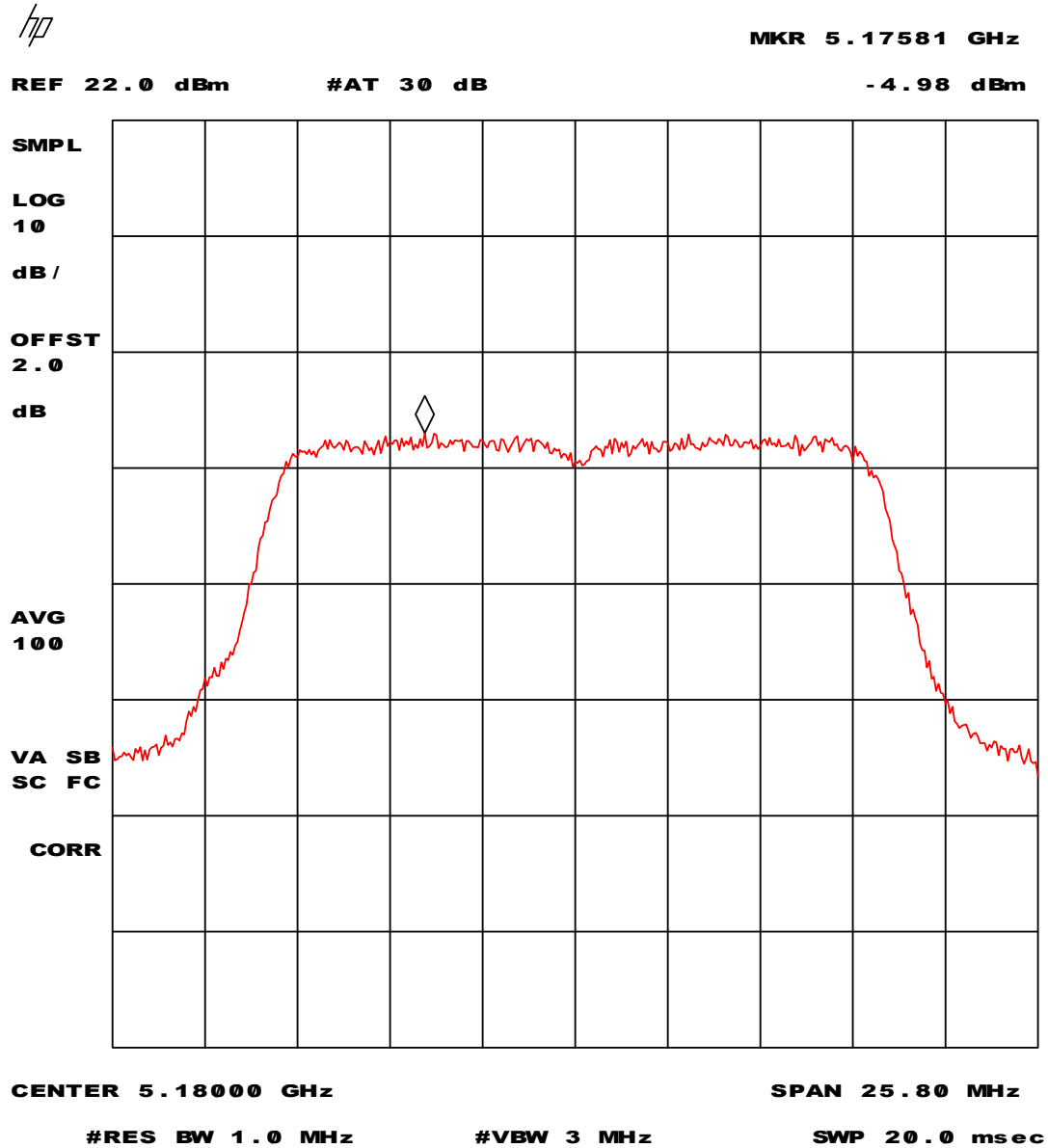
Plot 42 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 42 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 9 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



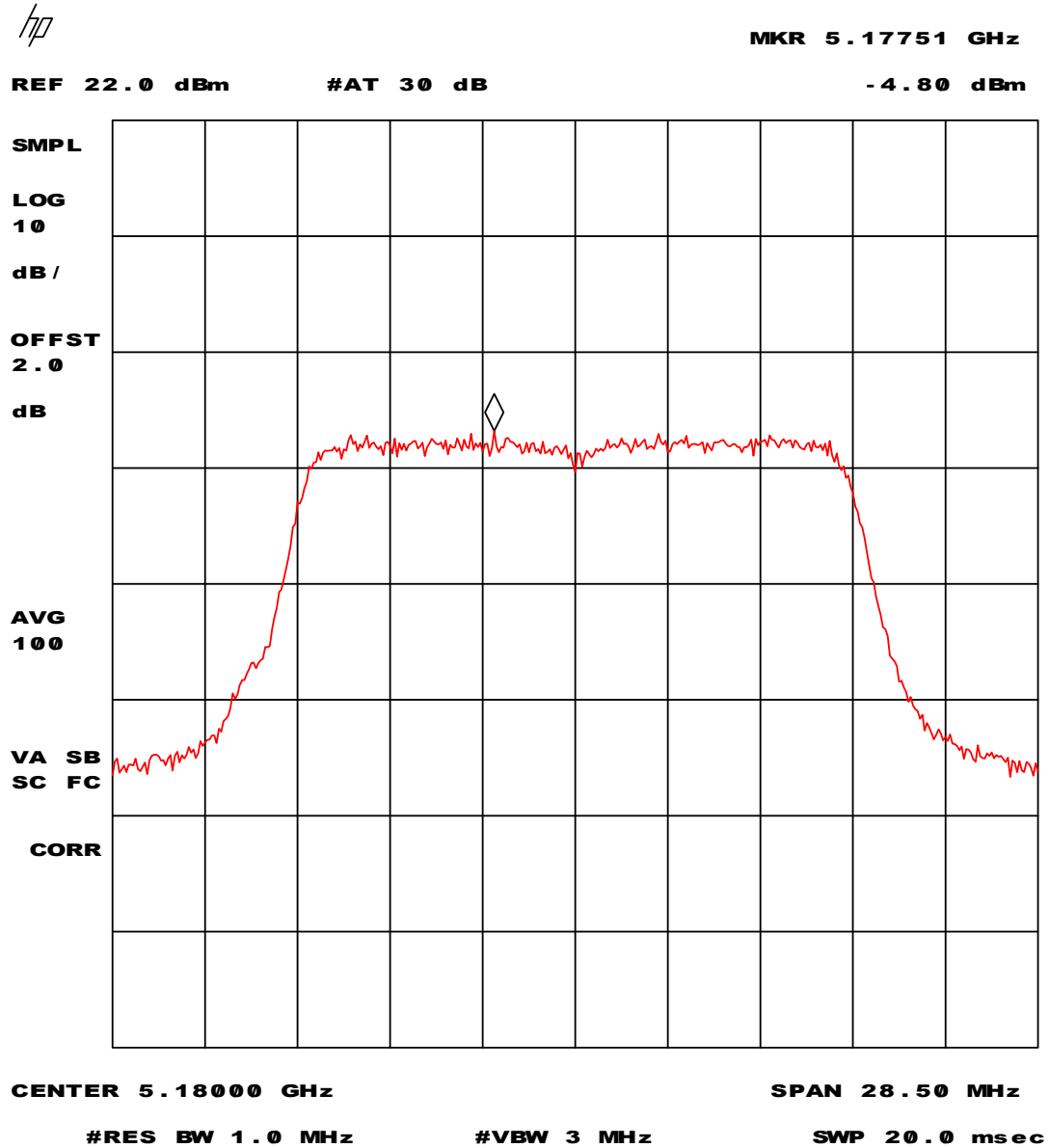
Plot 43 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 43 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 18 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



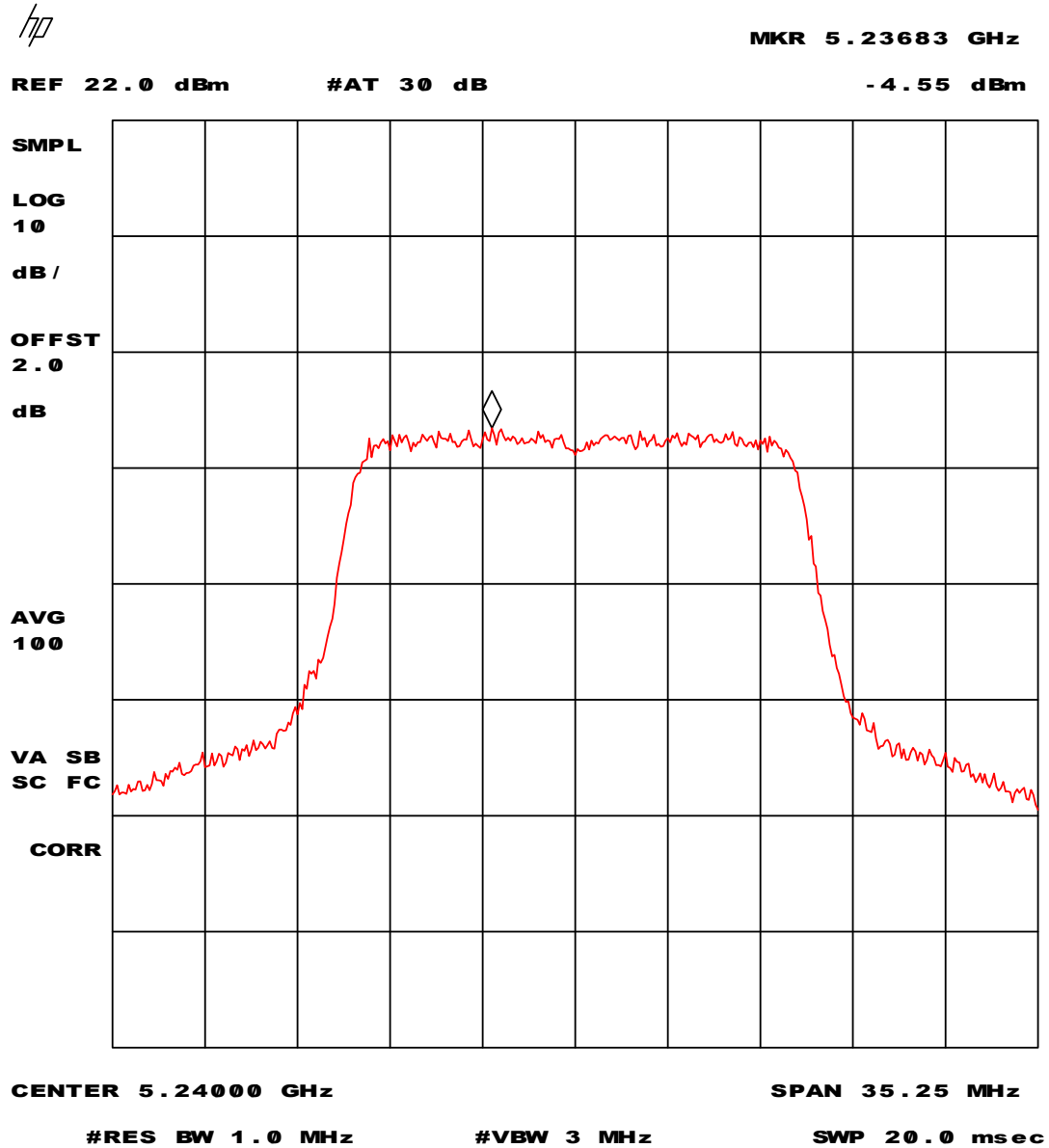
Plot 44 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 44 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 36 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



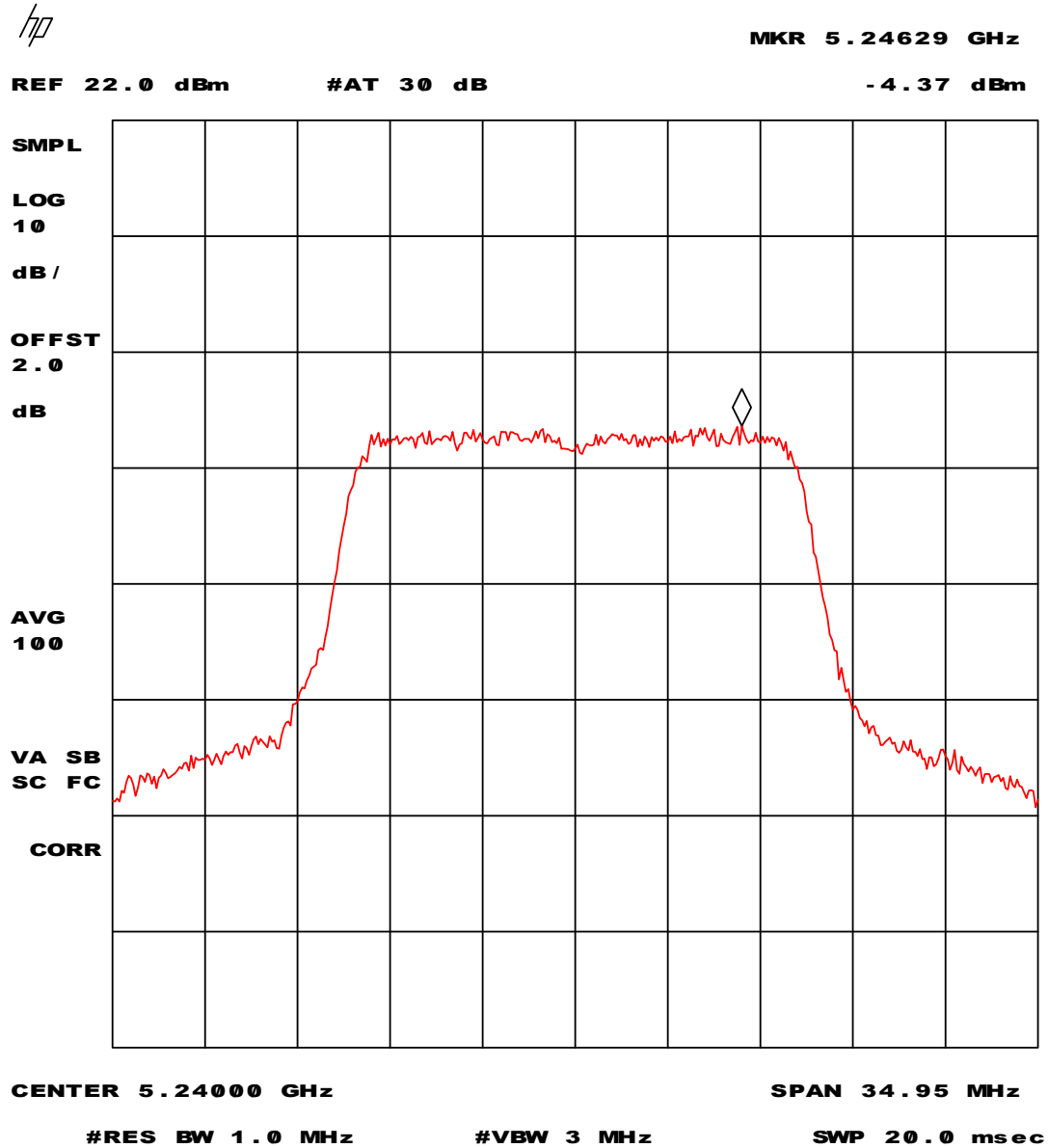
Plot 45 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 45 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 54 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



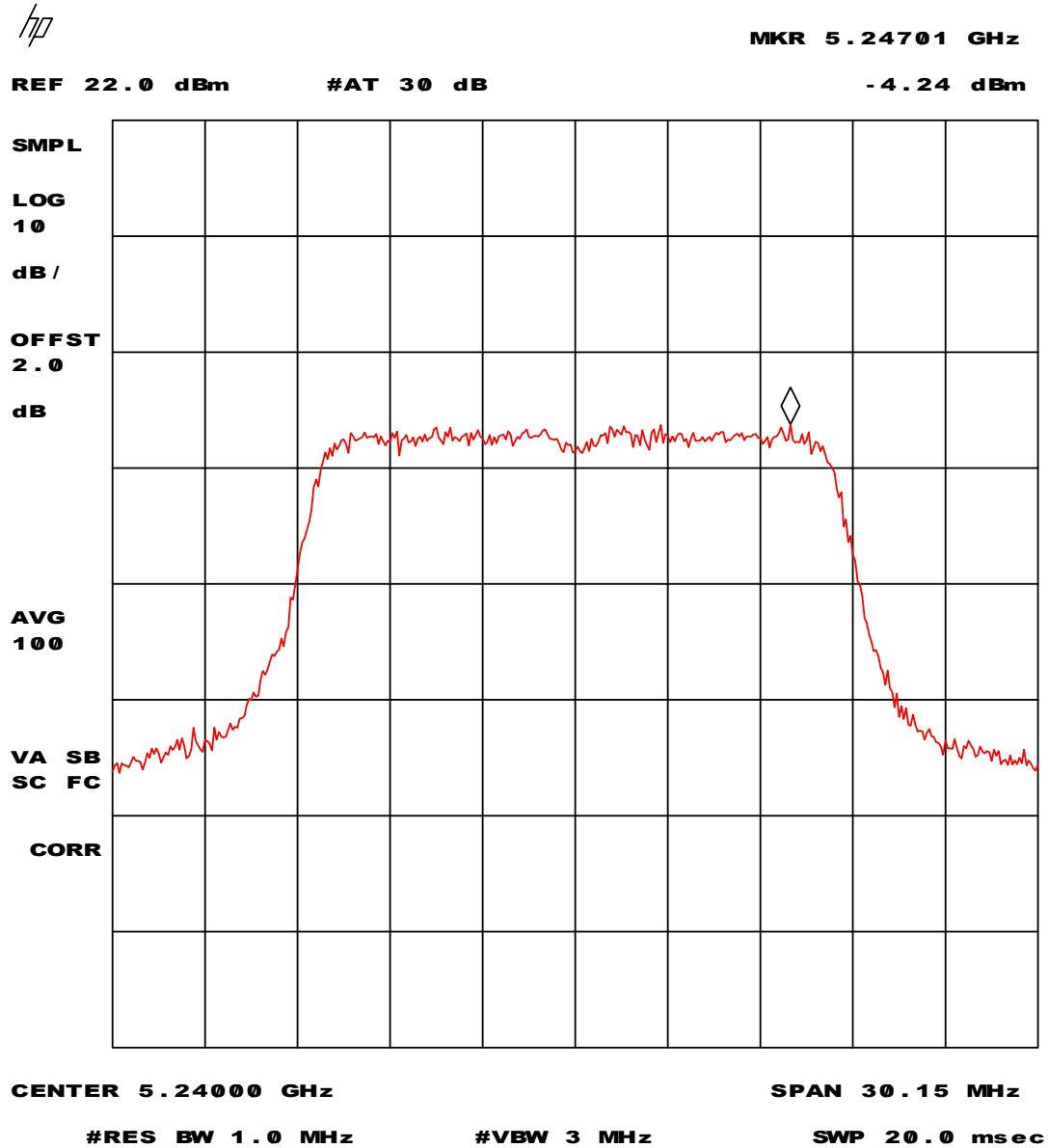
Plot 46 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 46 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 6 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



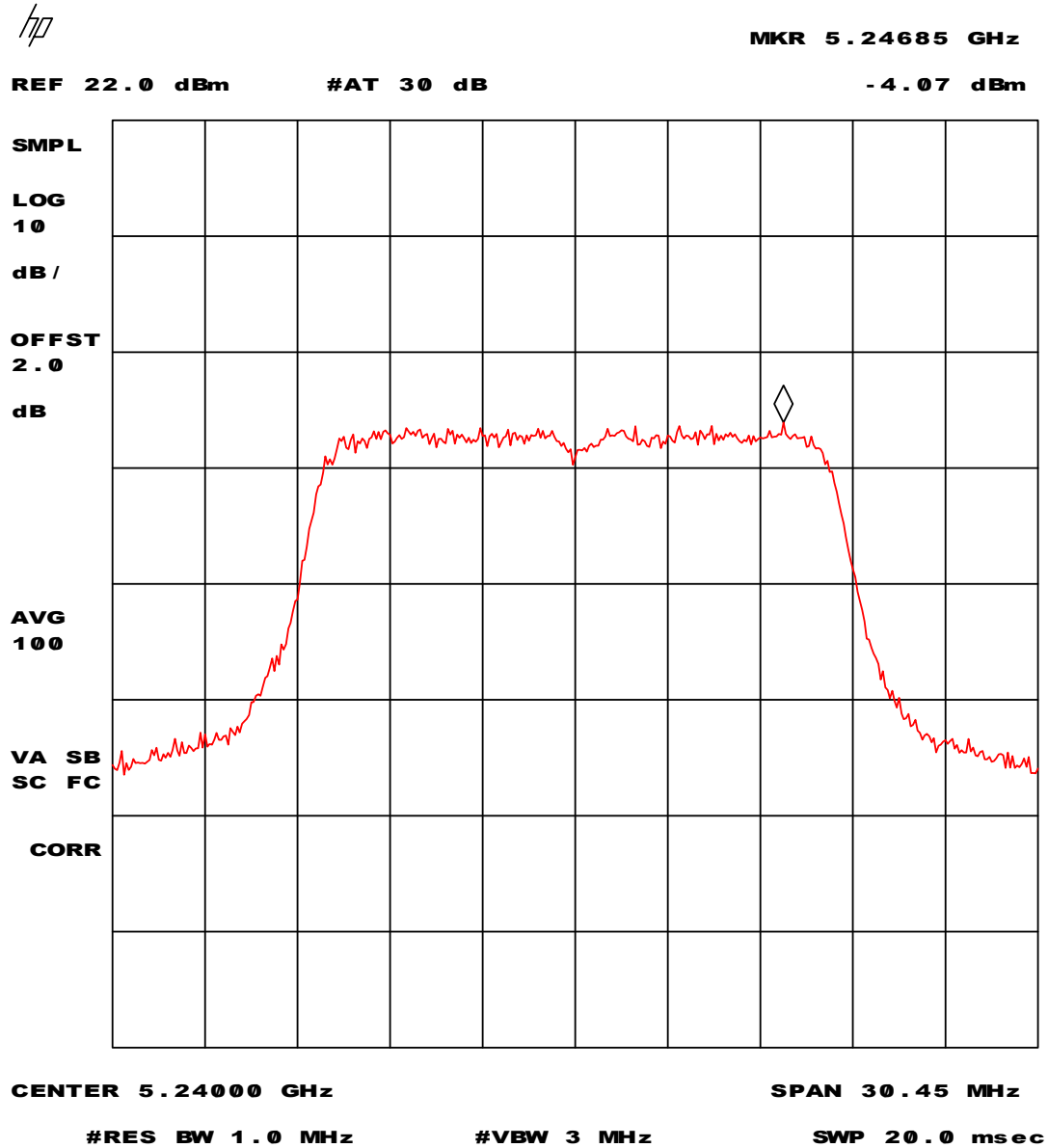
Plot 47 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 47 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 9 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



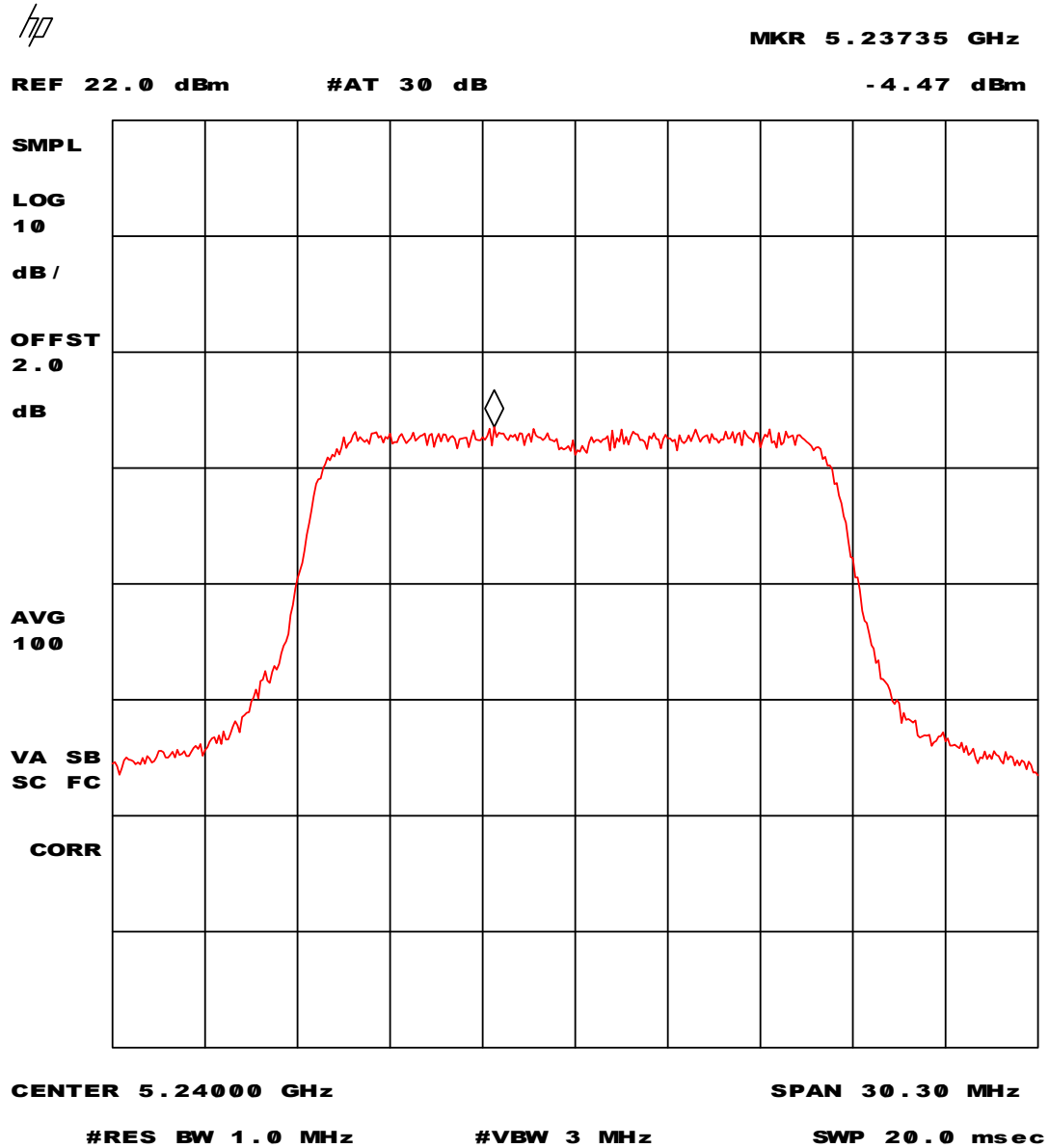
Plot 48 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 48 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 18 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



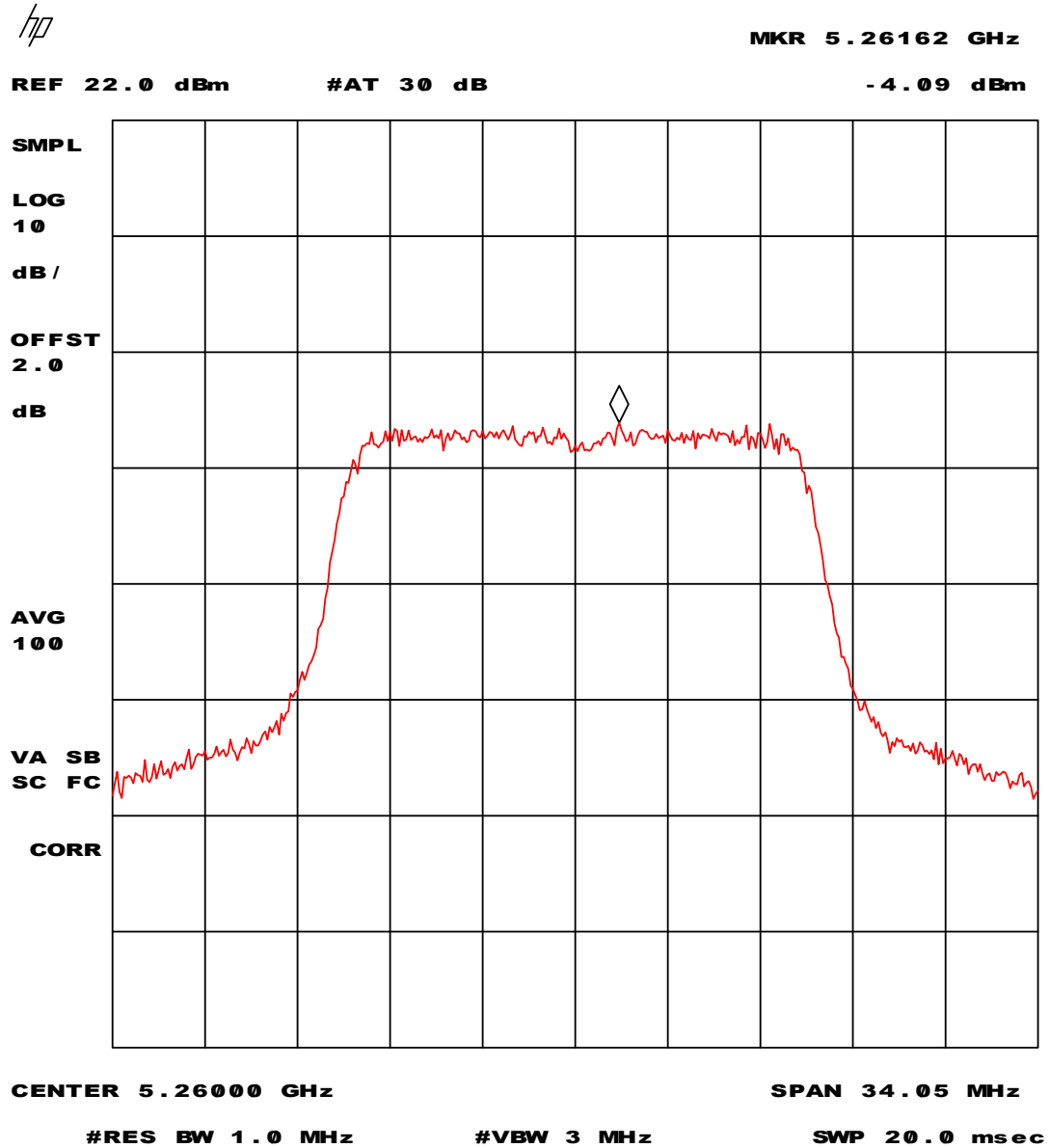
Plot 49 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 49 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 36 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



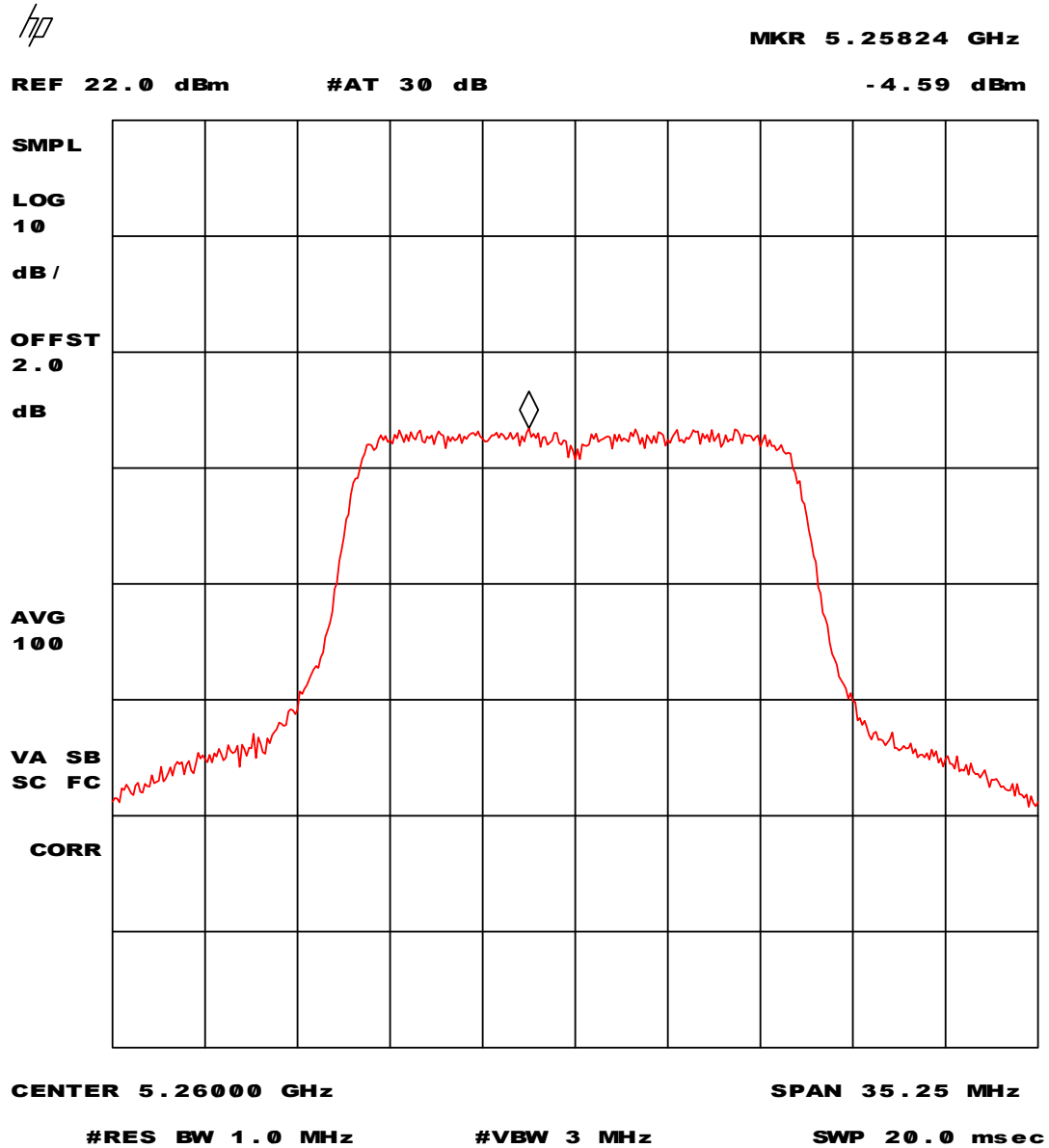
Plot 50 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 50 depicts the peak power spectral density (conducted) in any 1 MHz band with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 54 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



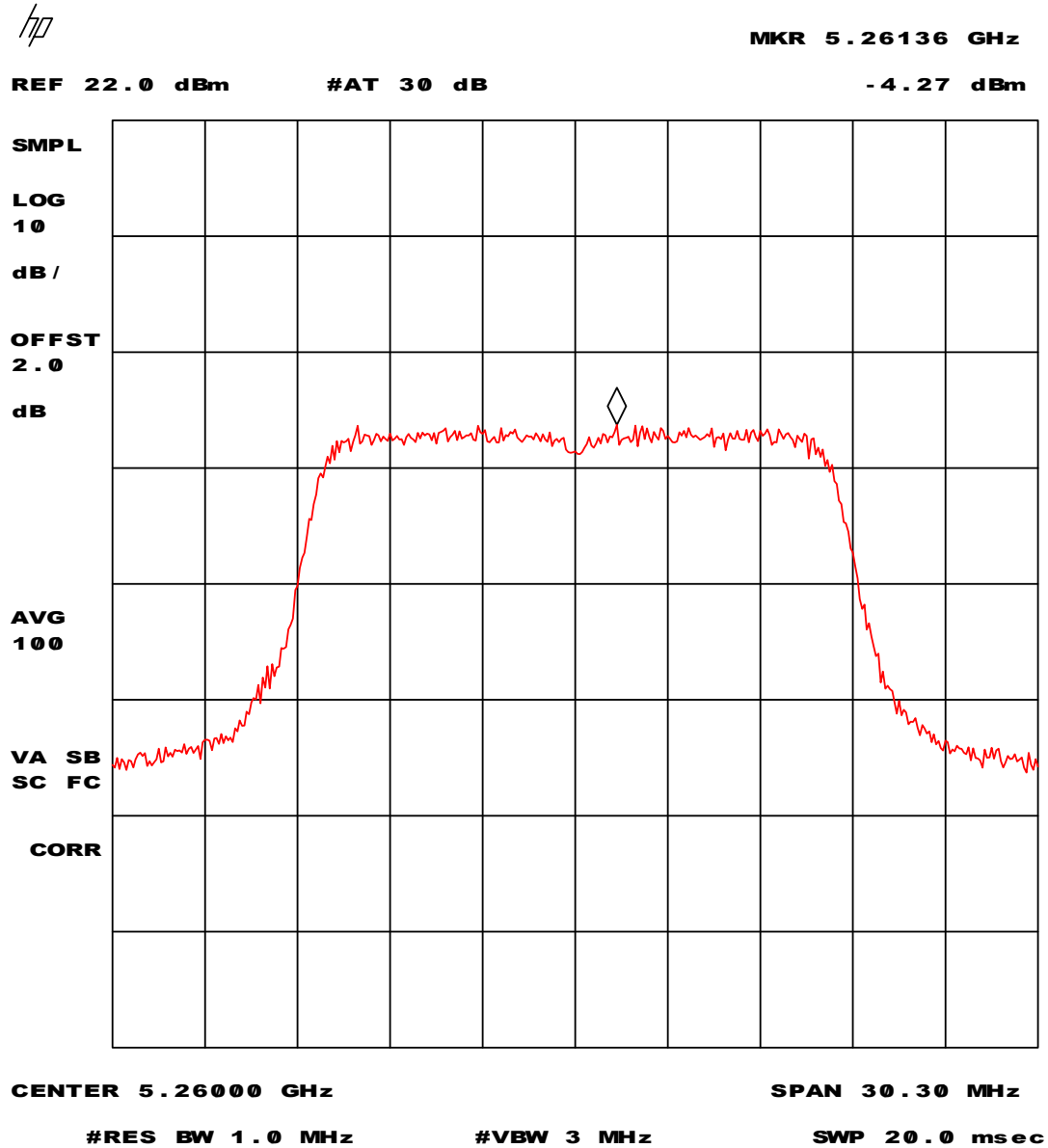
Plot 51 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 51 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 2.0 dB.



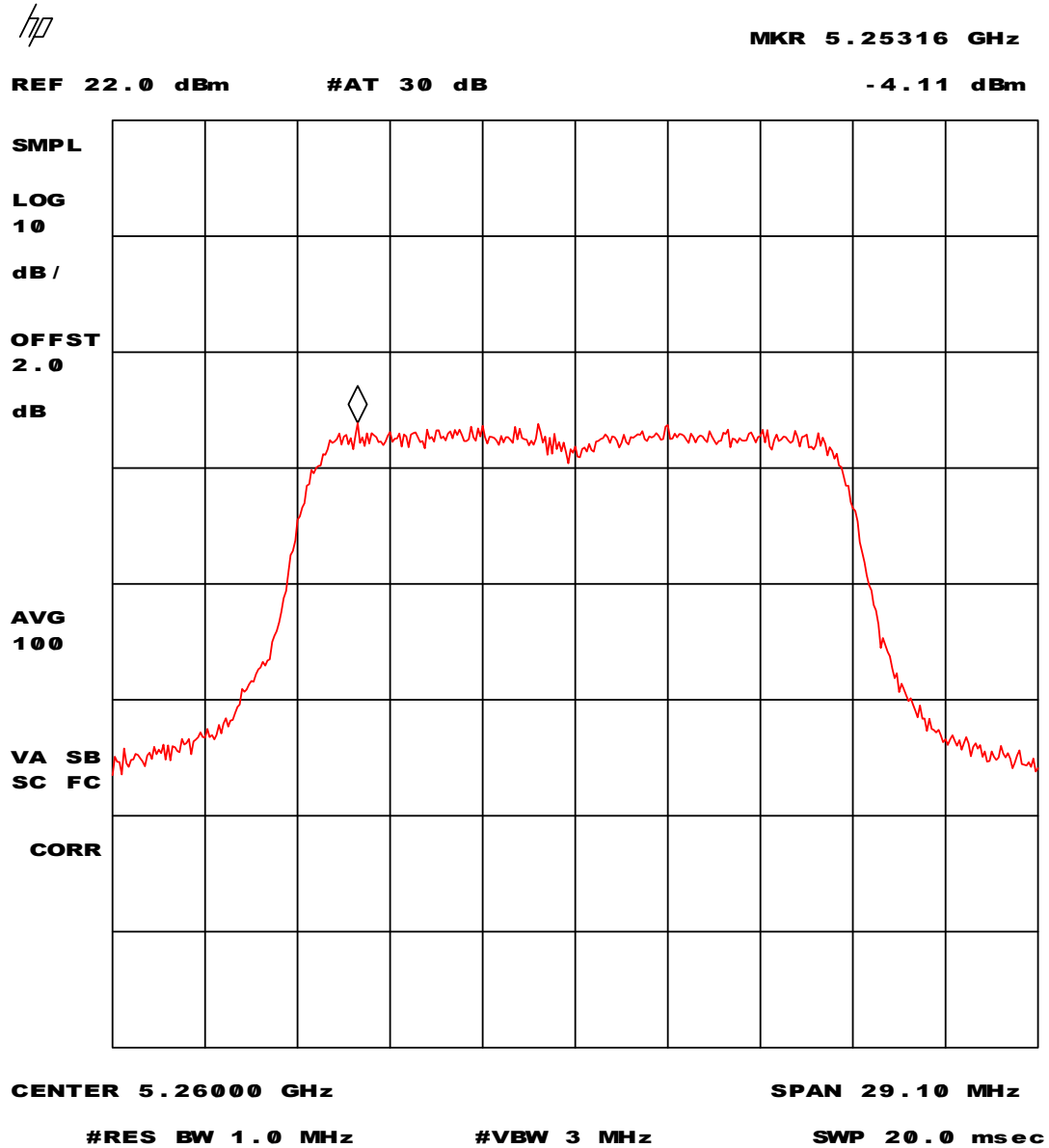
Plot 52 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 52 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 2.0 dB.



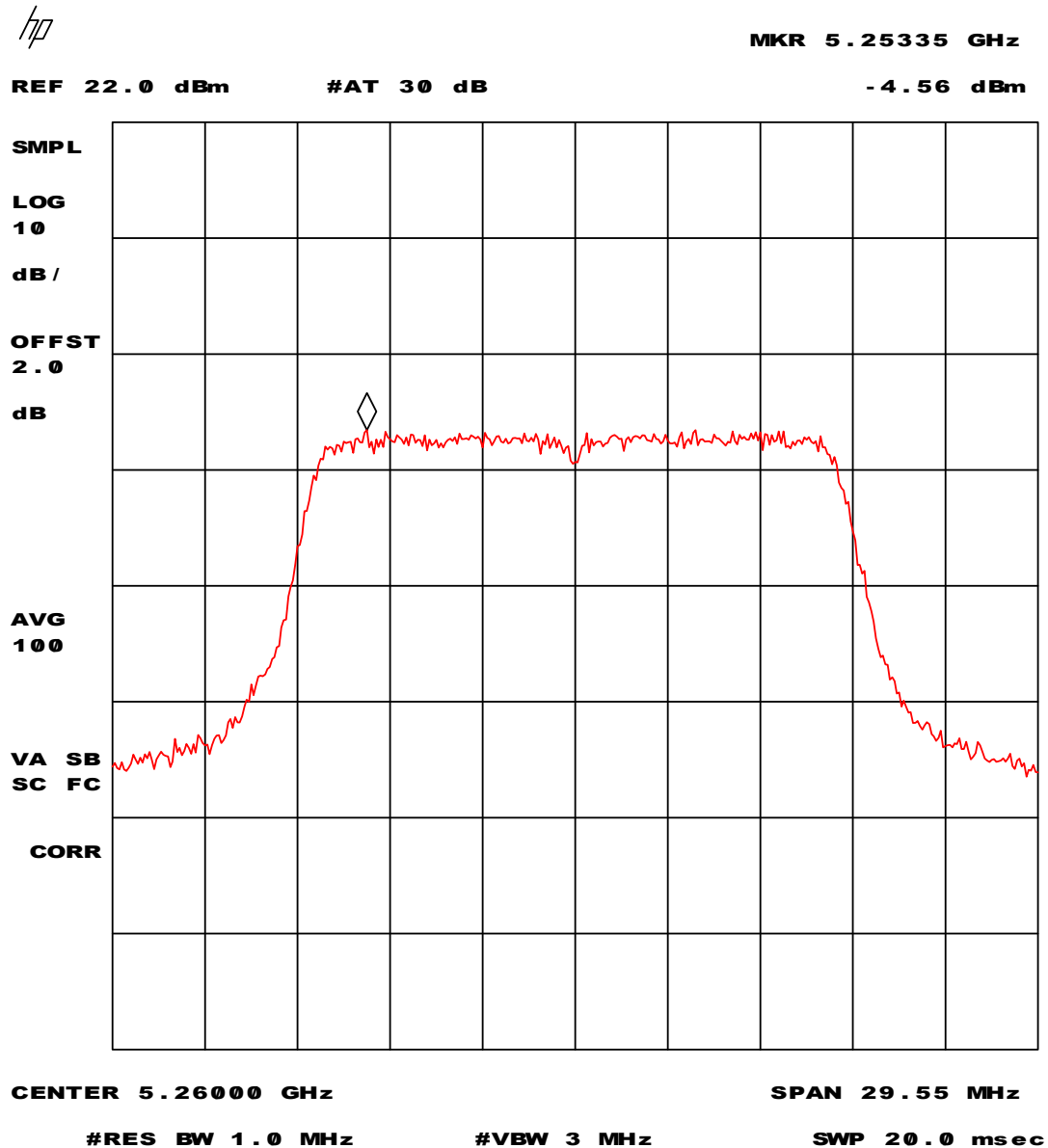
Plot 53 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 53 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 2.0 dB.



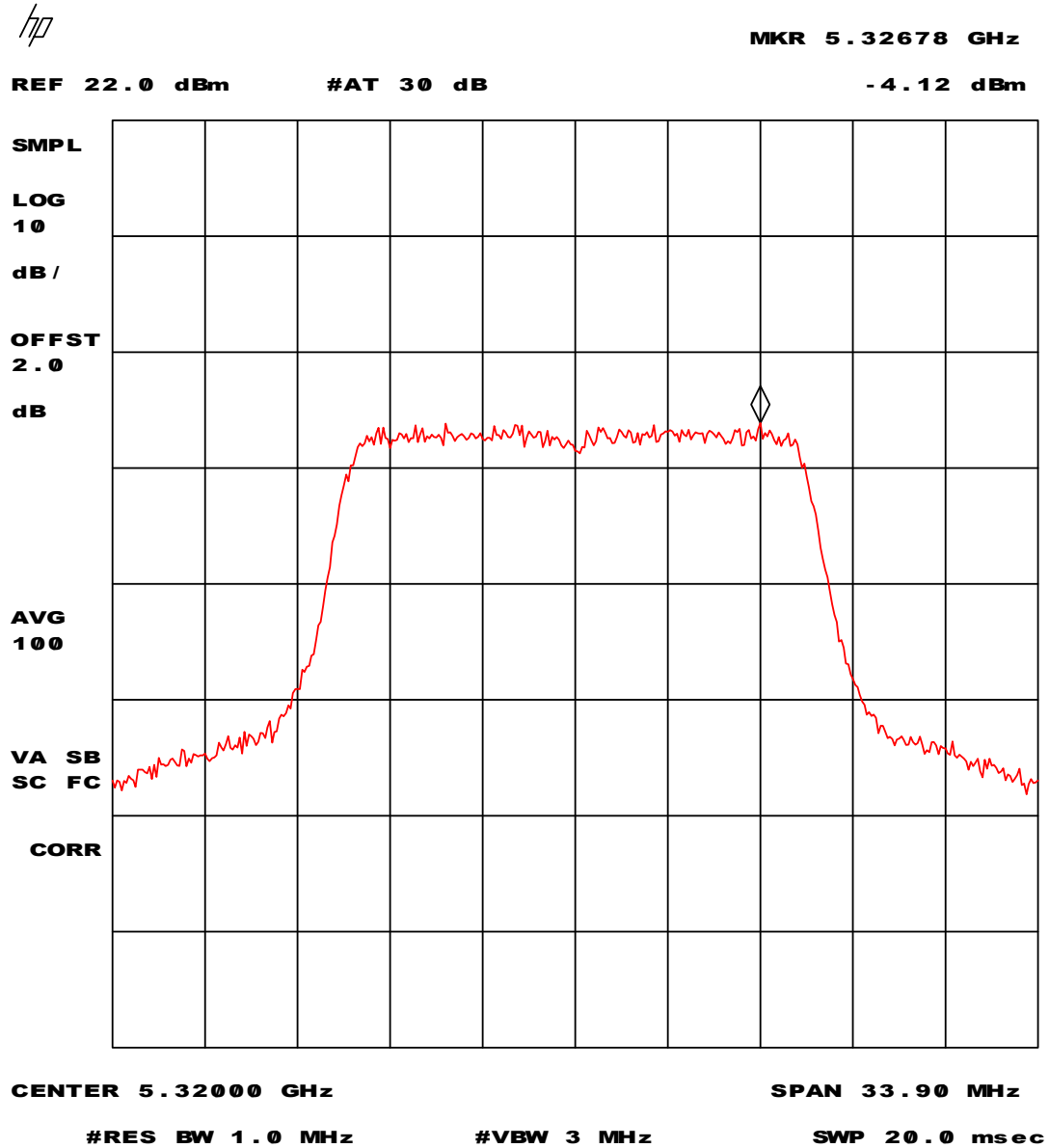
Plot 54 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 54 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 36 Mbit/s. Corrected (offset) for measurement cable losses of 2.0 dB.



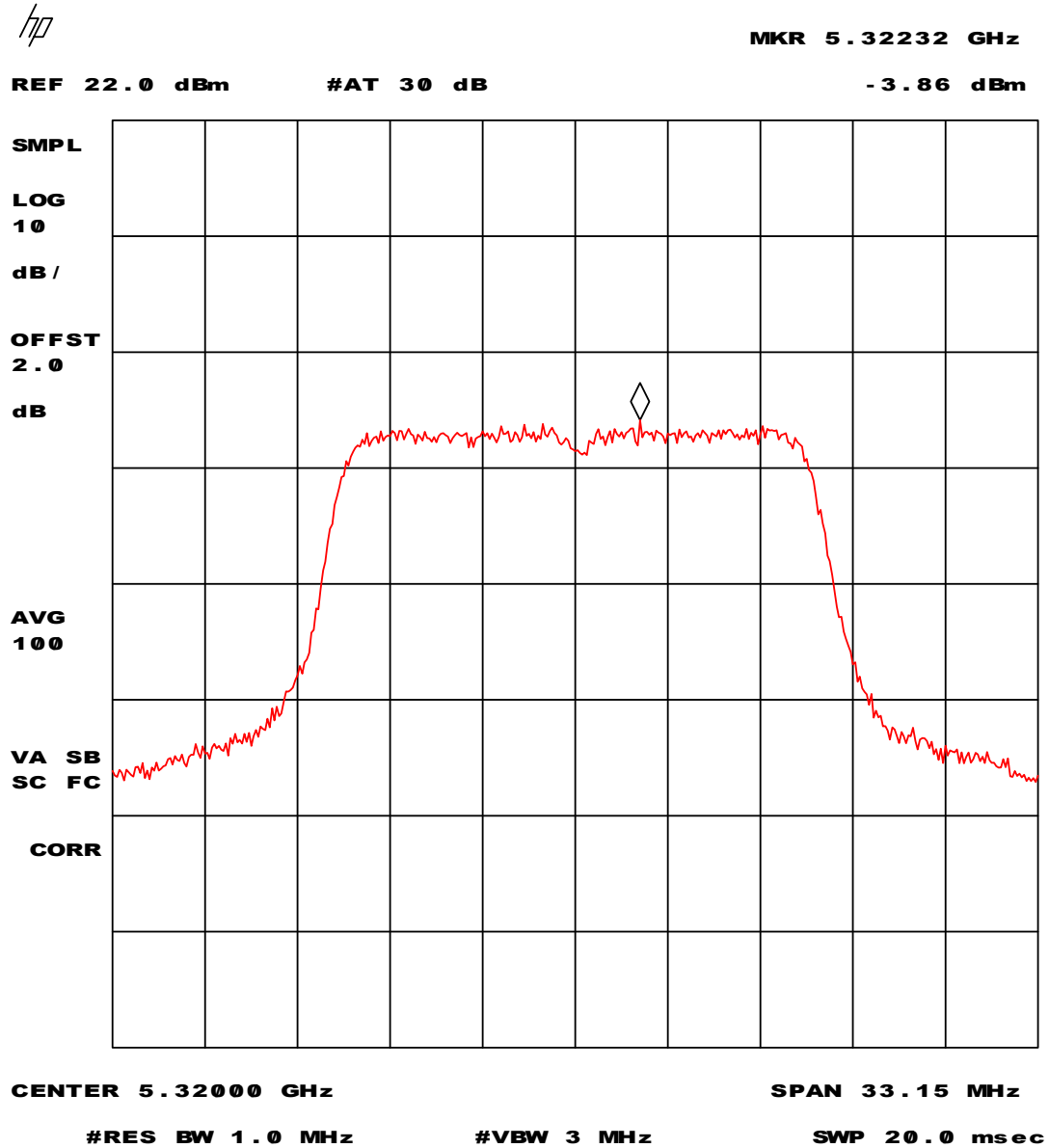
Plot 55 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 55 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 2.0 dB.



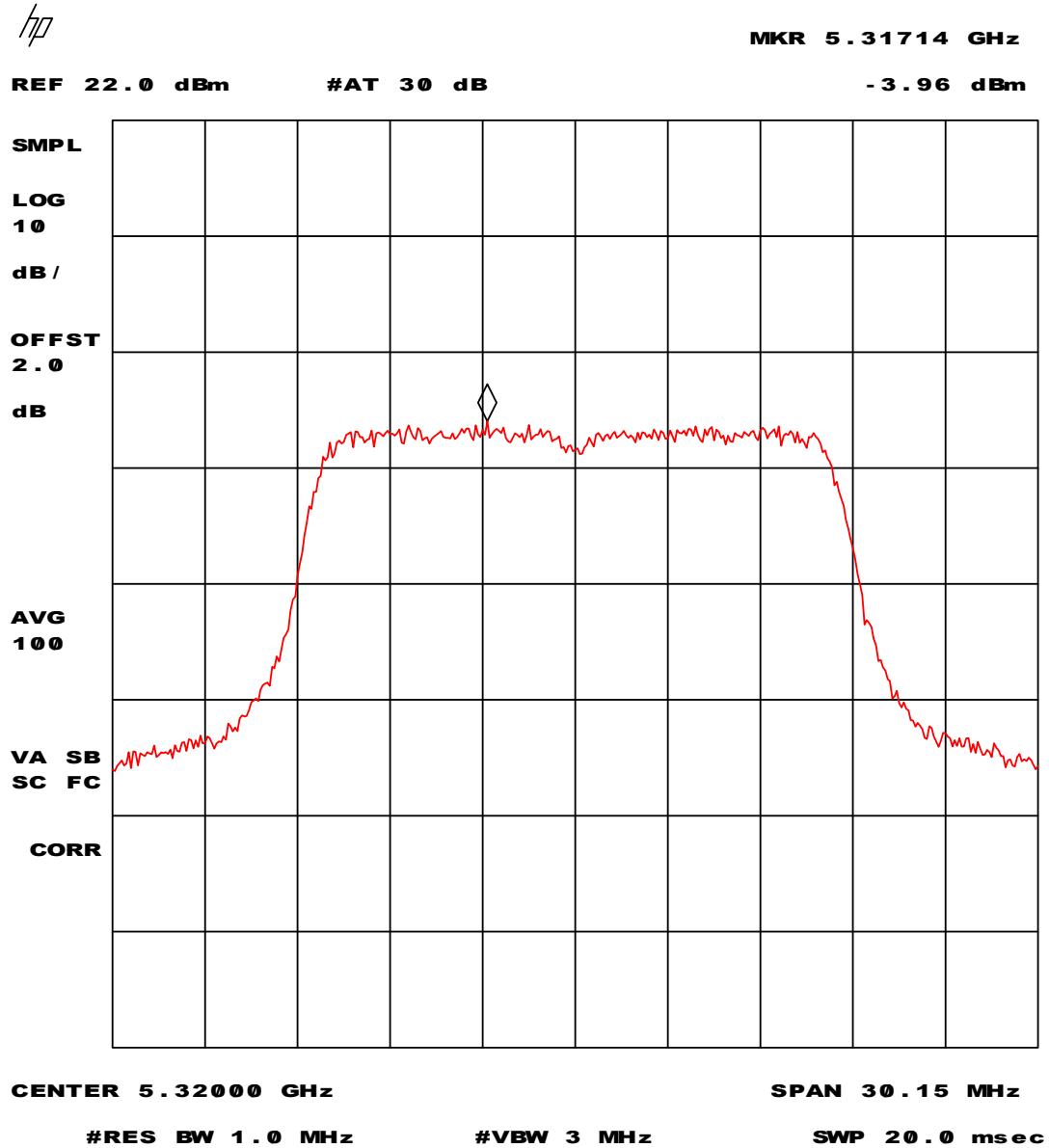
Plot 56 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 56 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 2.0 dB.



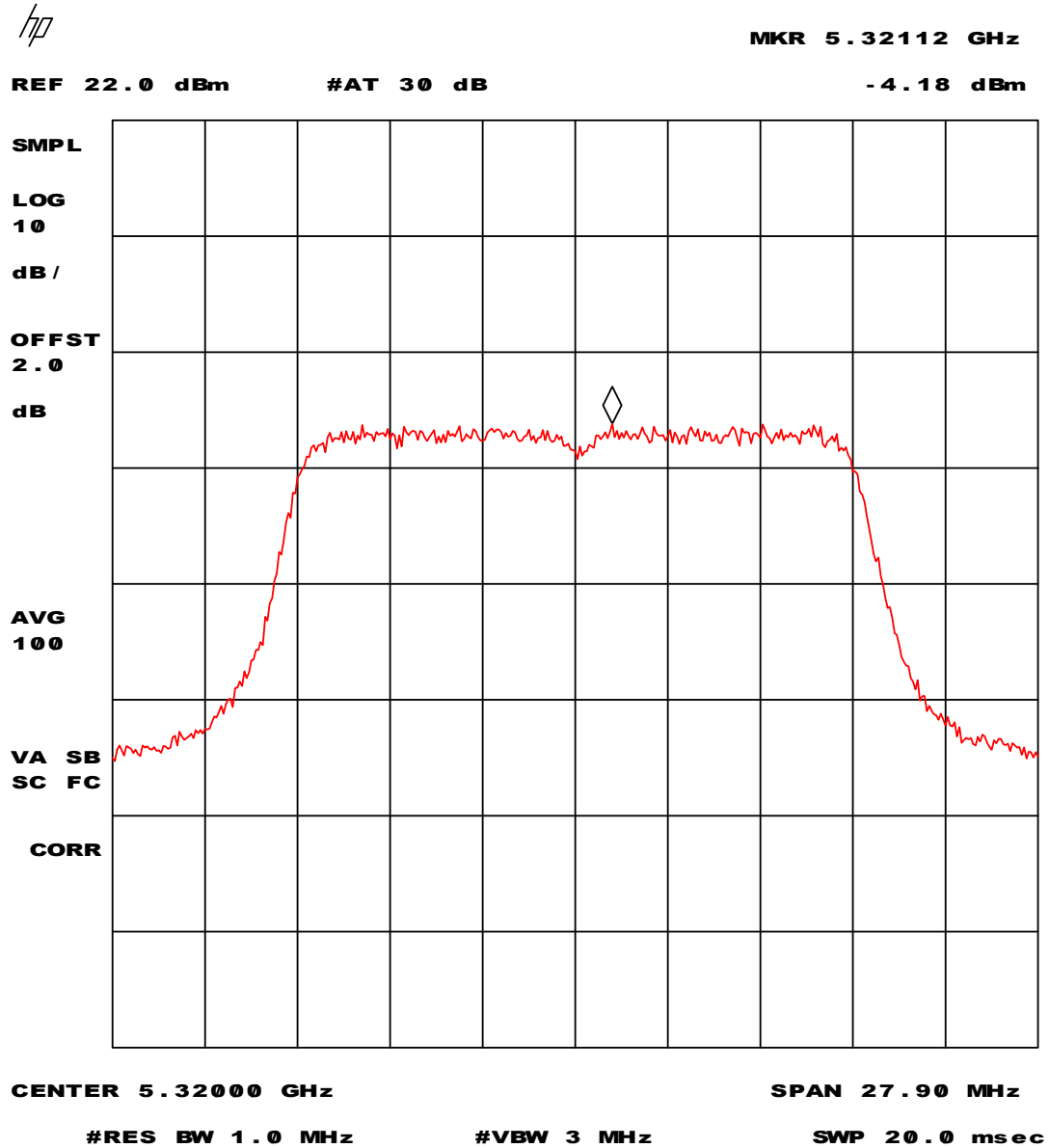
Plot 57 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 57 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 2.0 dB.



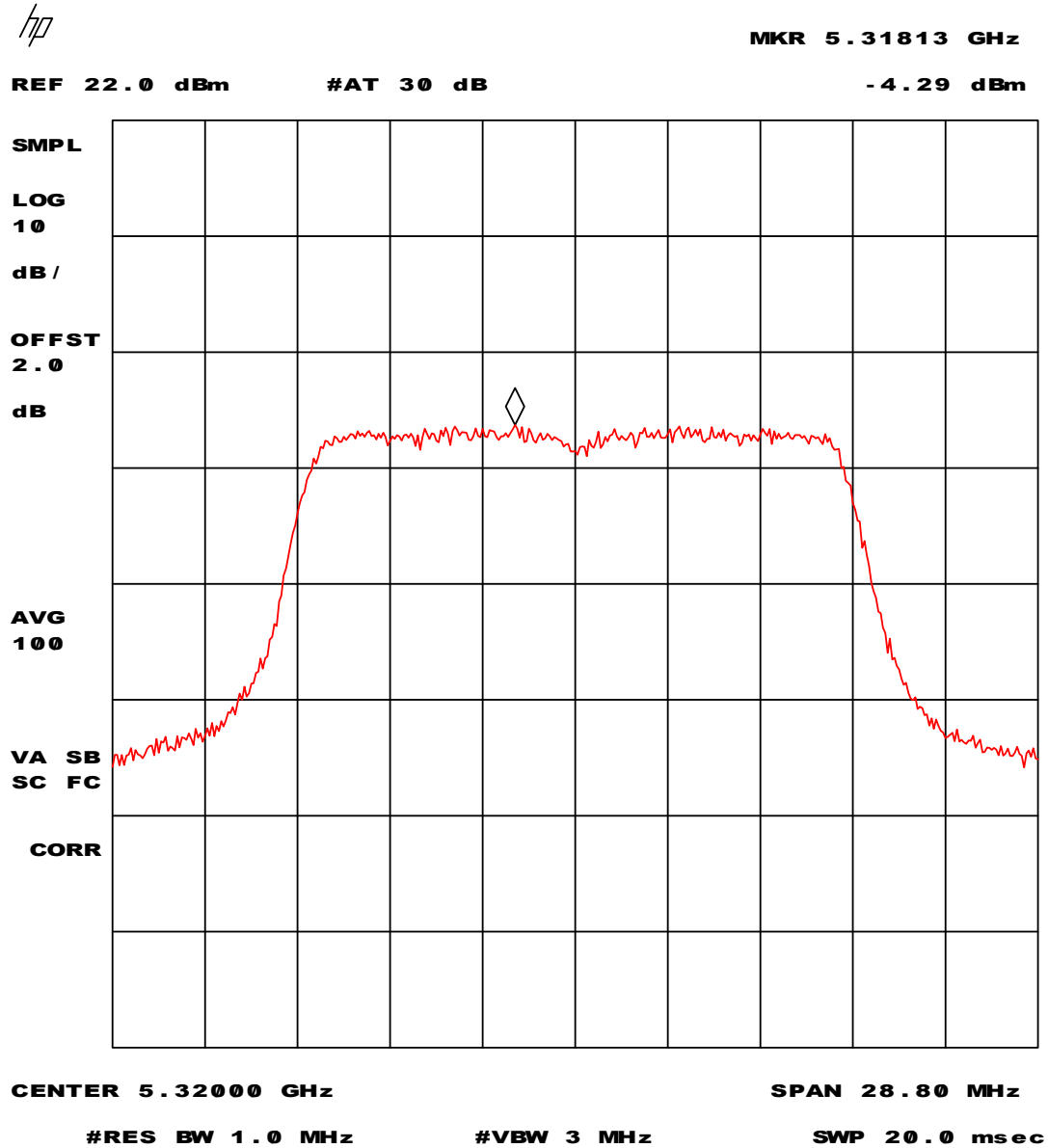
Plot 58 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 58 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 2.0 dB.



Plot 59 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 59 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 2.0 dB.

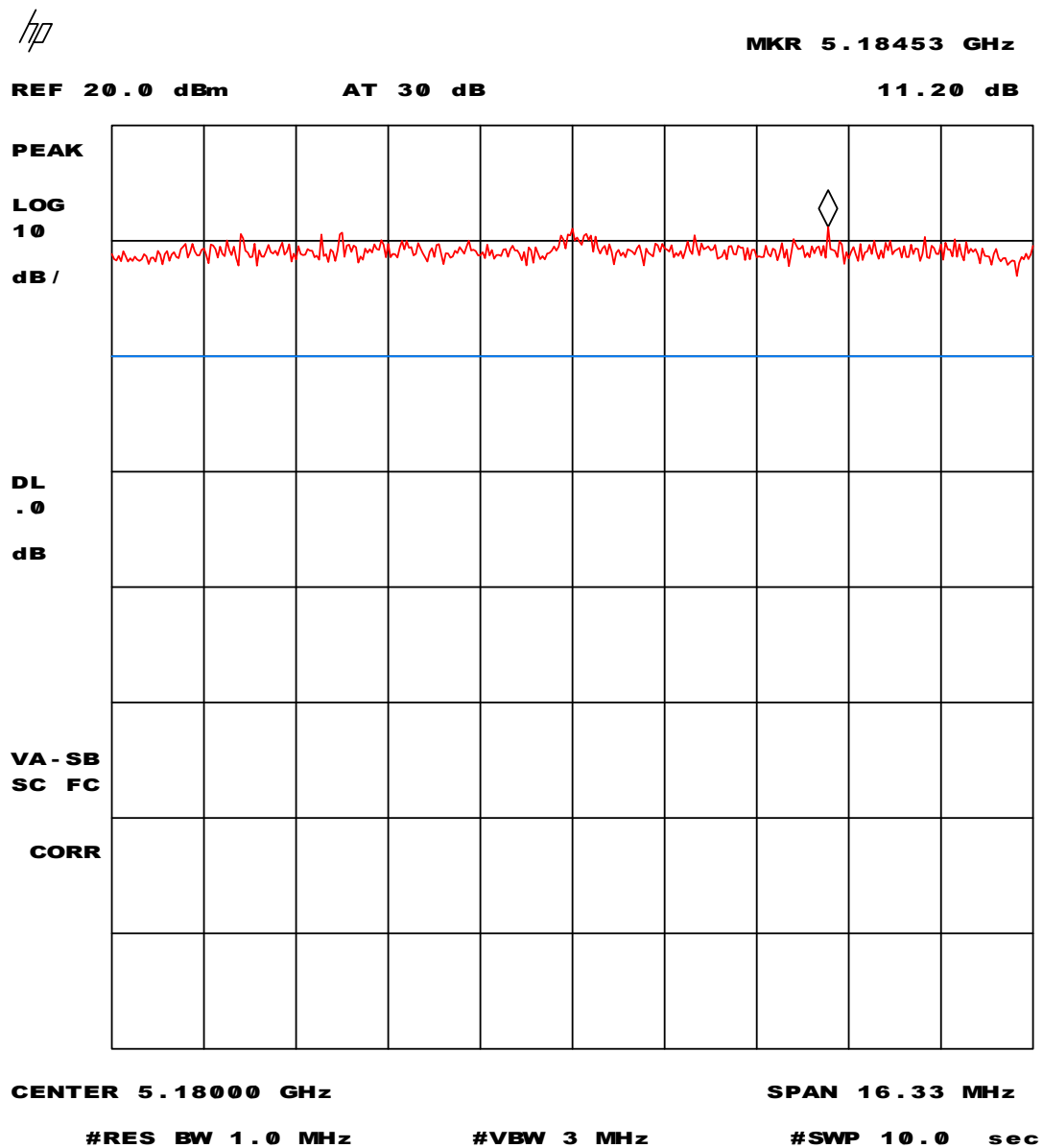


Plot 60 - Peak power spectral density (conducted) in any 1 MHz band.

Plot 60 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 2.0 dB.

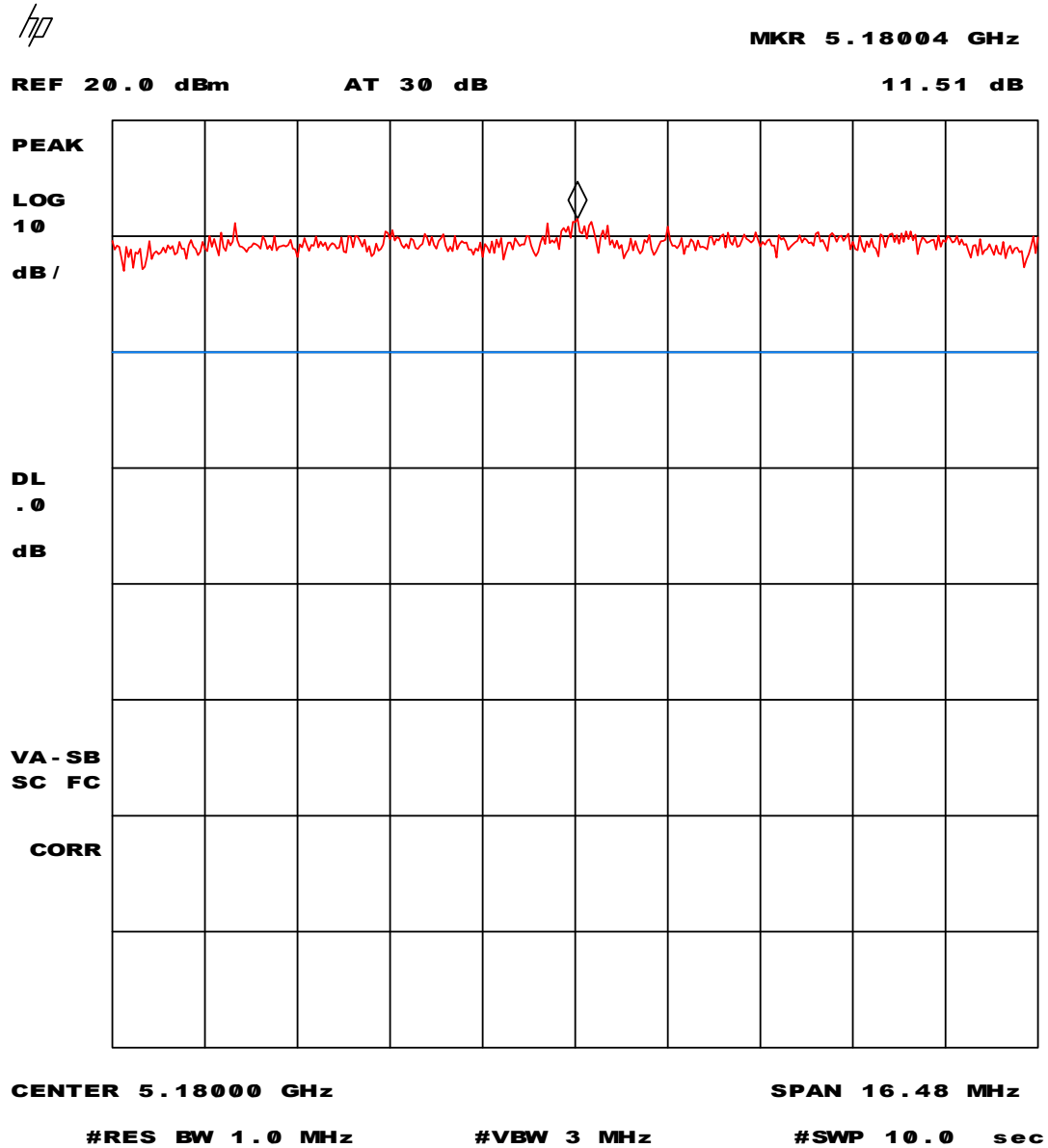


#### 5.4 Ratio of the peak excursion of the modulation envelope.



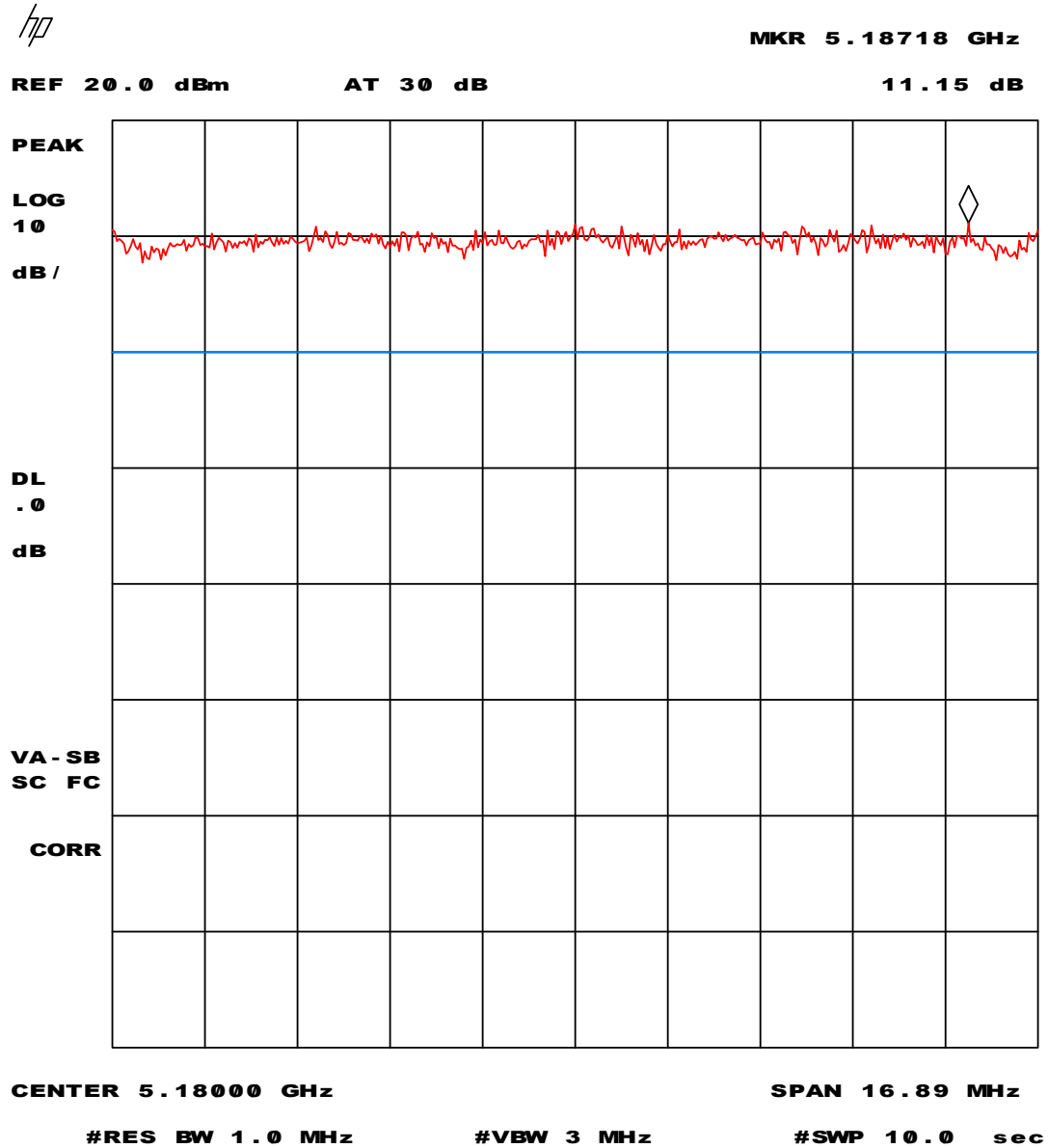
Plot 61 – Ratio of the peak excursion of the modulation envelope.

Plot 61 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 6 Mbit/s.



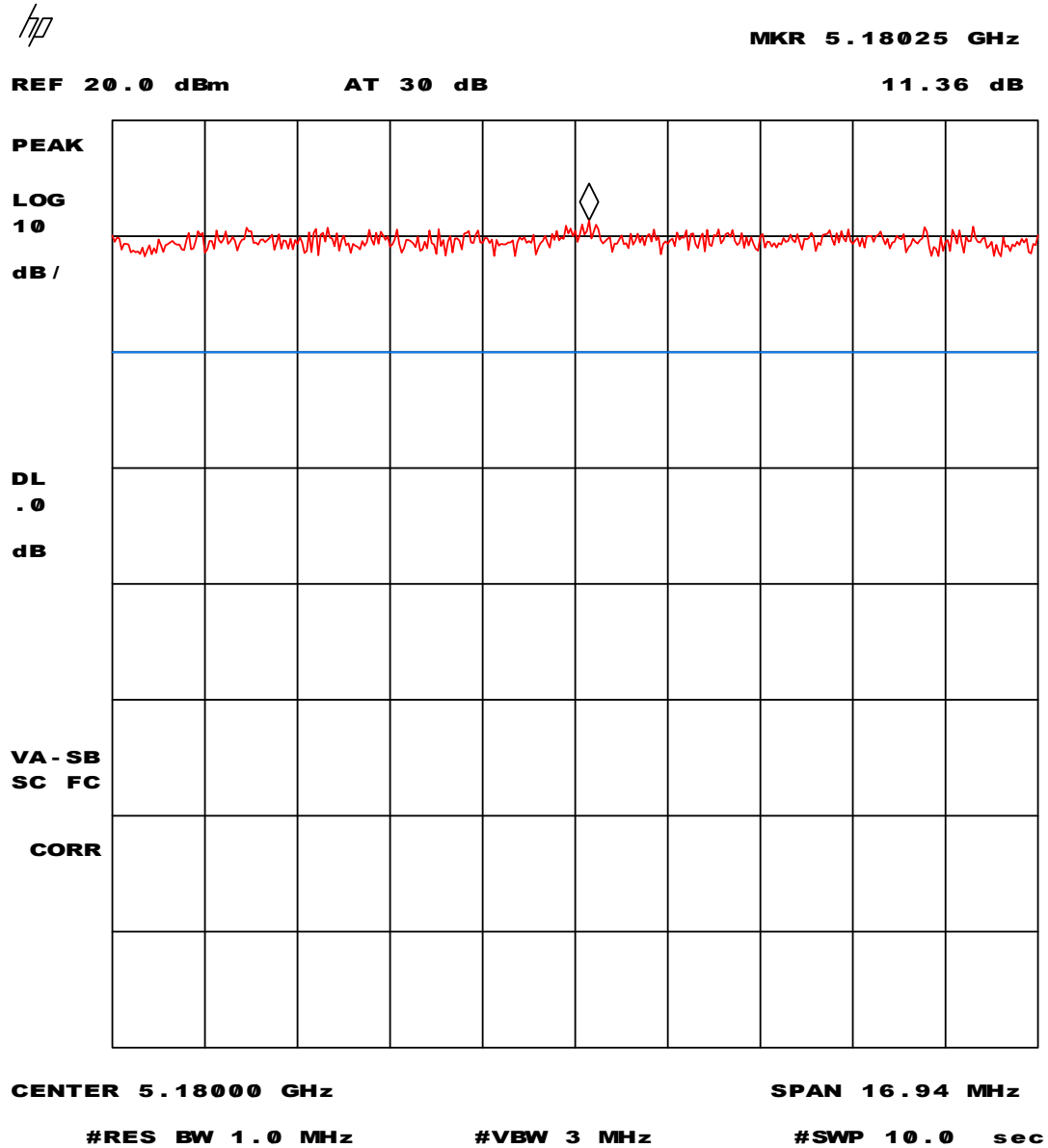
Plot 62 – Ratio of the peak excursion of the modulation envelope.

Plot 62 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 9 Mbit/s.



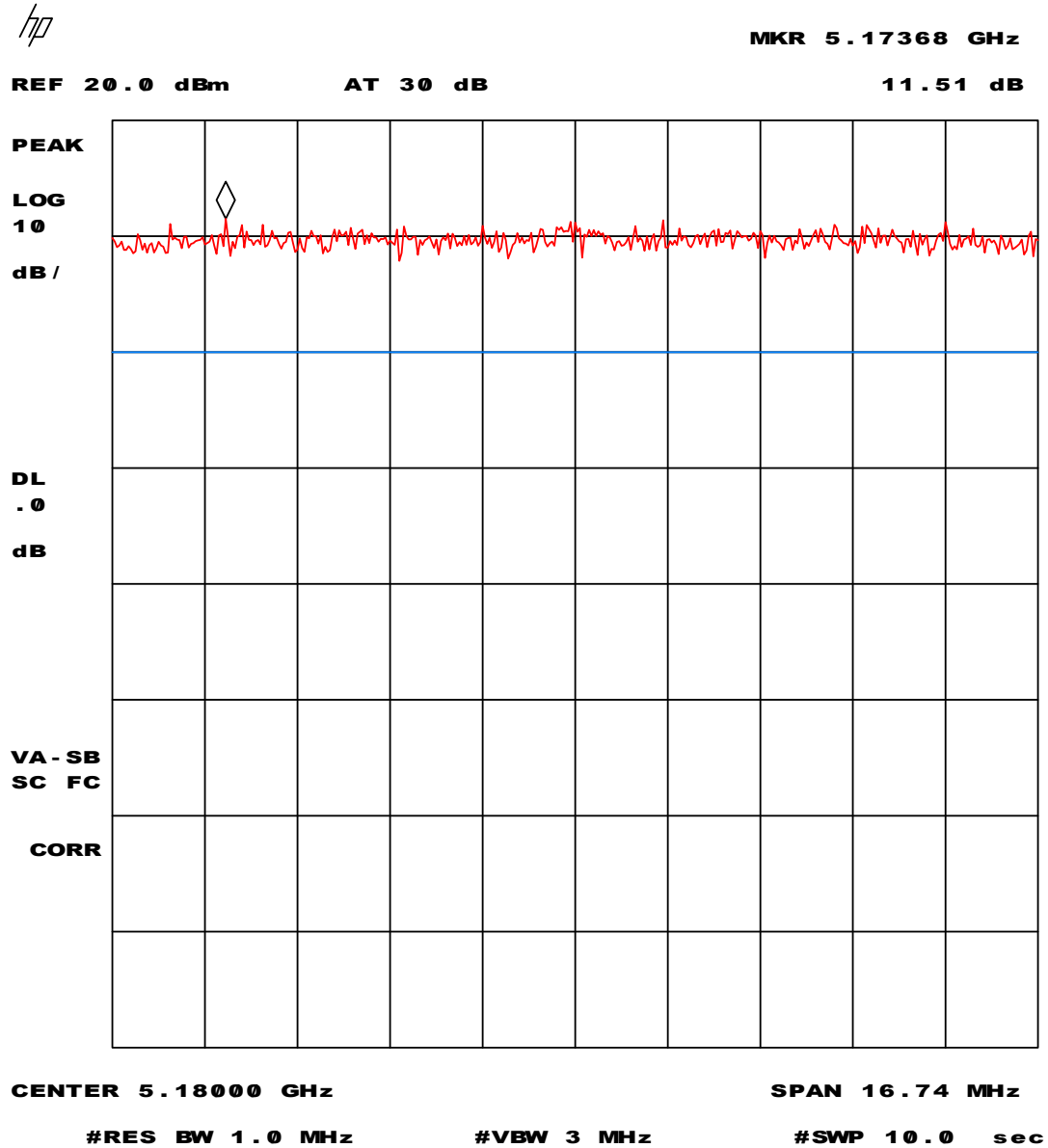
Plot 63 – Ratio of the peak excursion of the modulation envelope.

Plot 63 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 18 Mbit/s.



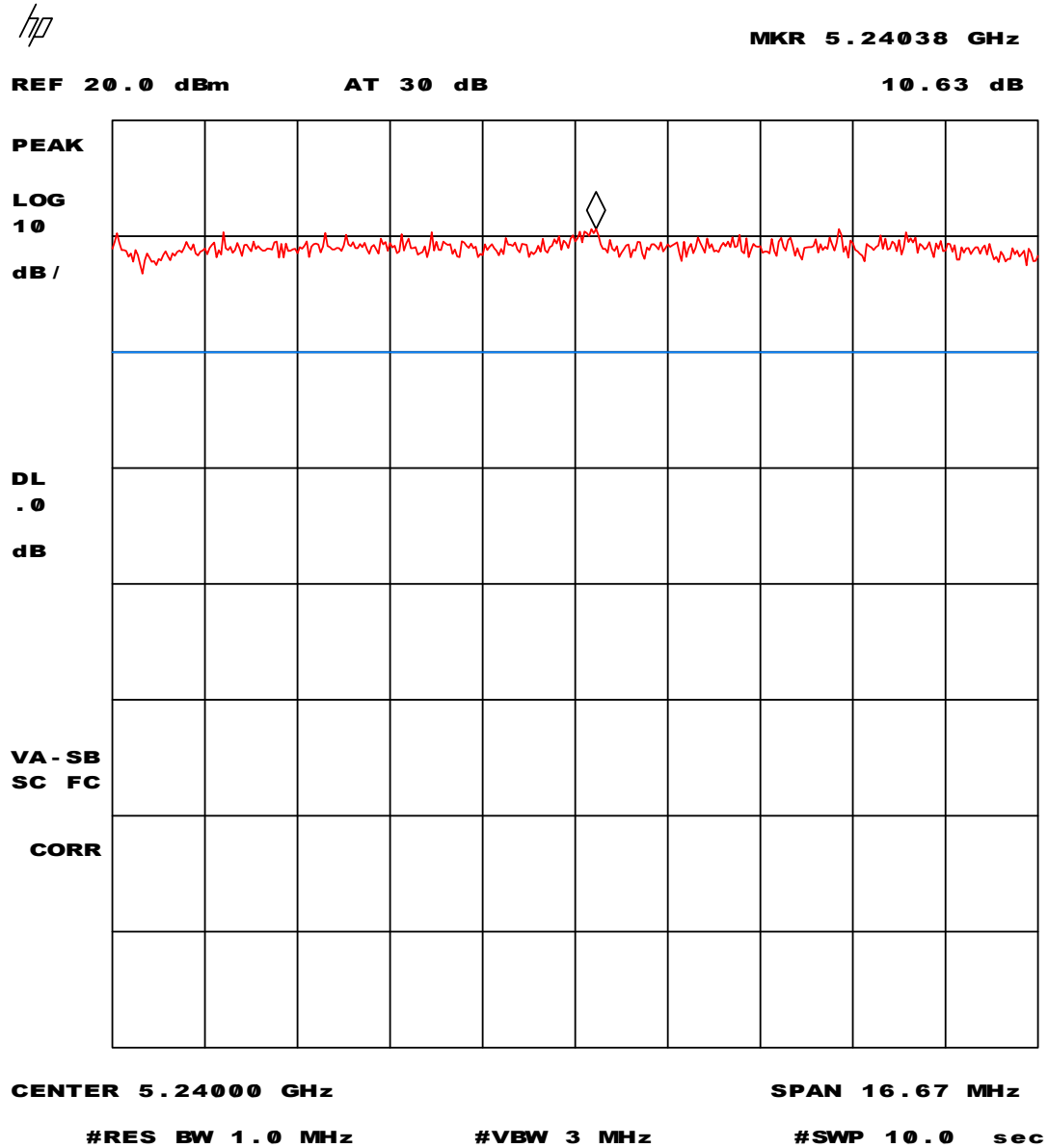
Plot 64 – Ratio of the peak excursion of the modulation envelope.

Plot 64 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 36 Mbit/s.



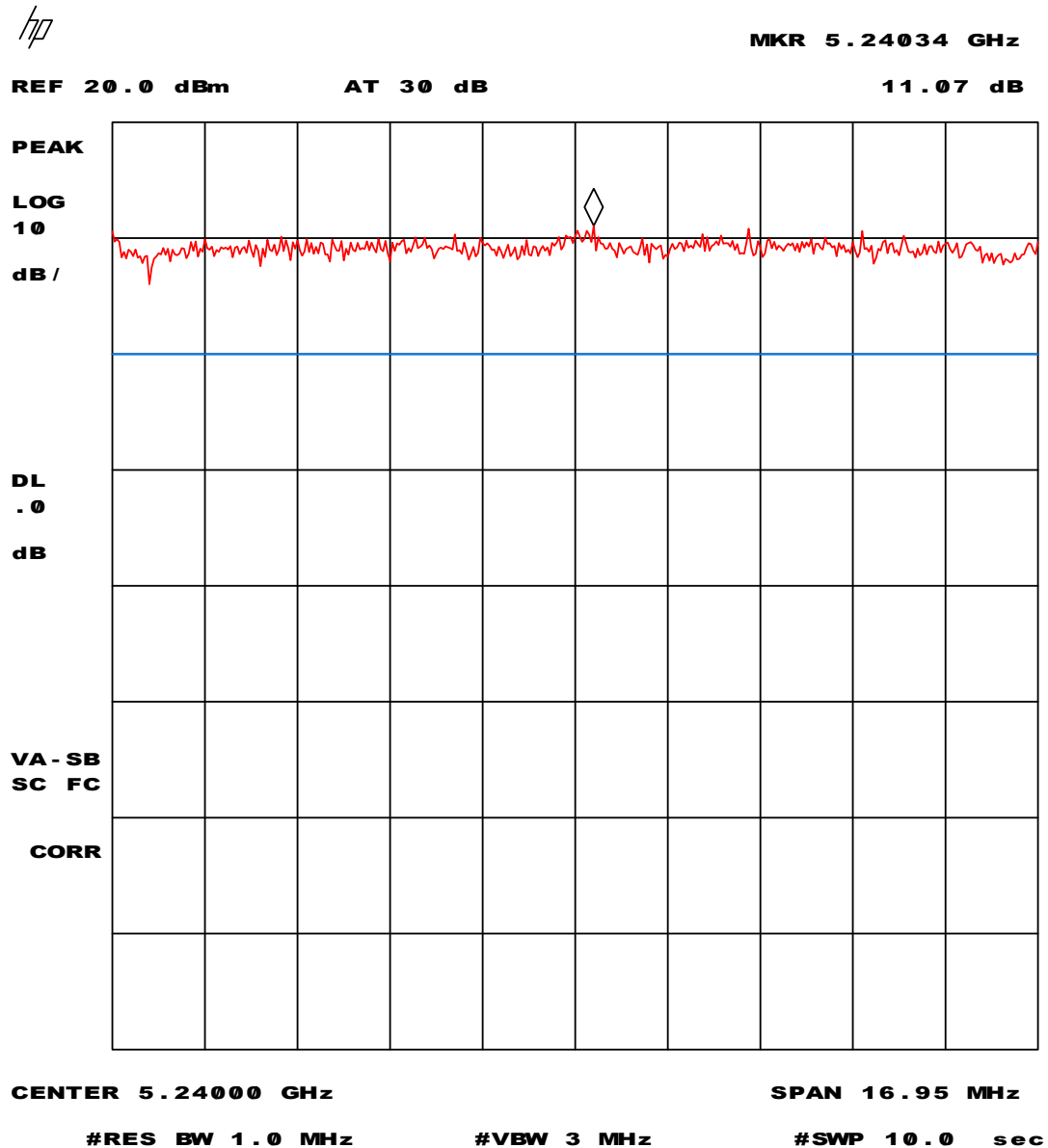
Plot 65 – Ratio of the peak excursion of the modulation envelope.

Plot 65 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 36 (5180 MHz) and at a transmission bit-rate of 54 Mbit/s.



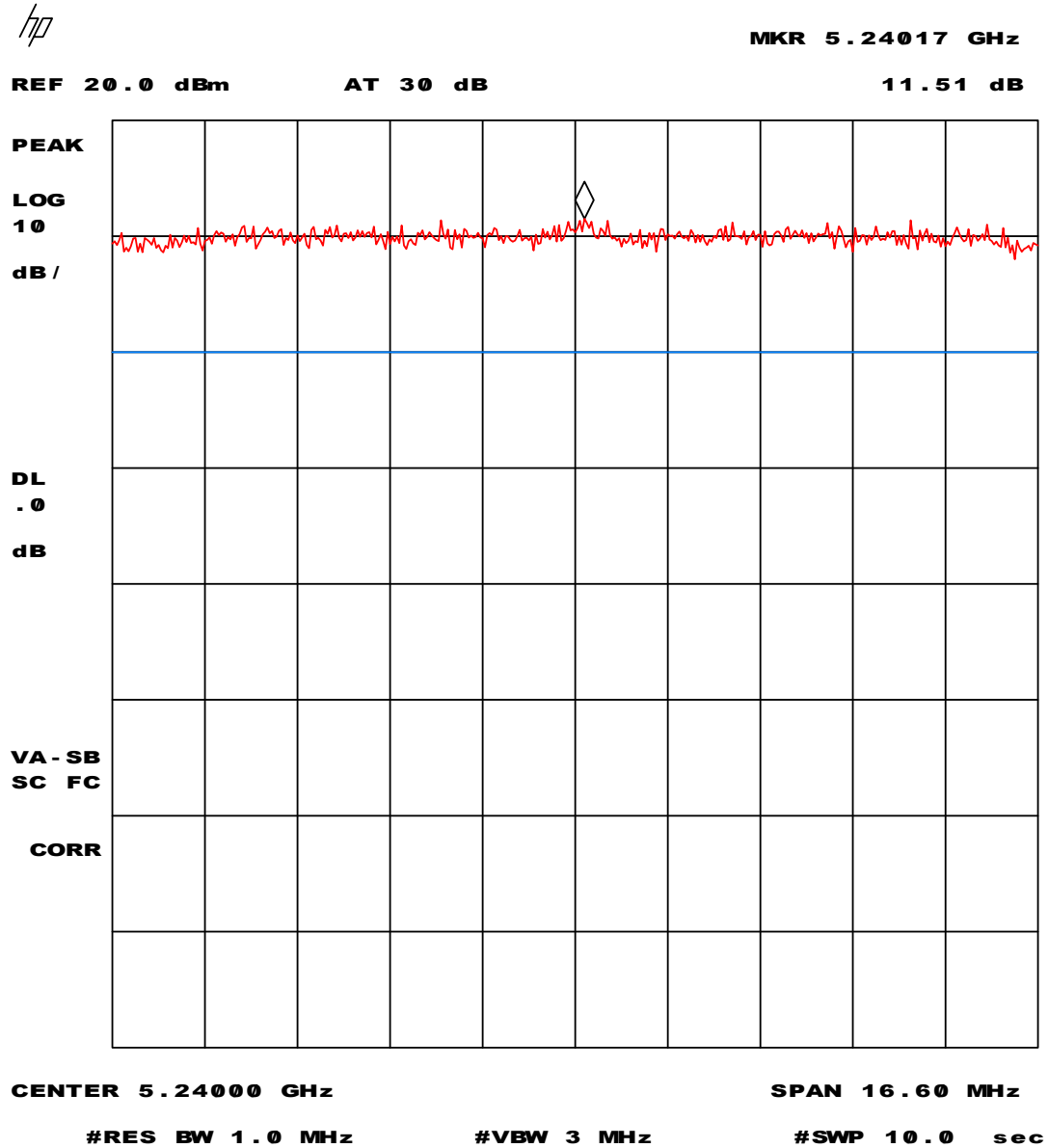
Plot 66 – Ratio of the peak excursion of the modulation envelope.

Plot 66 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 6 Mbit/s.



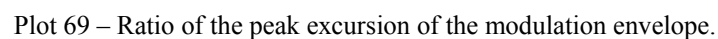
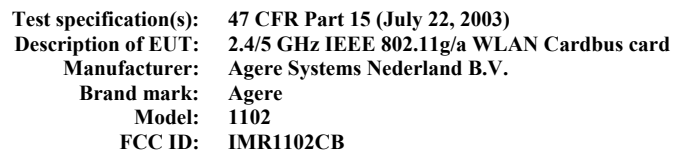
Plot 67 – Ratio of the peak excursion of the modulation envelope.

Plot 67 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 9 Mbit/s.

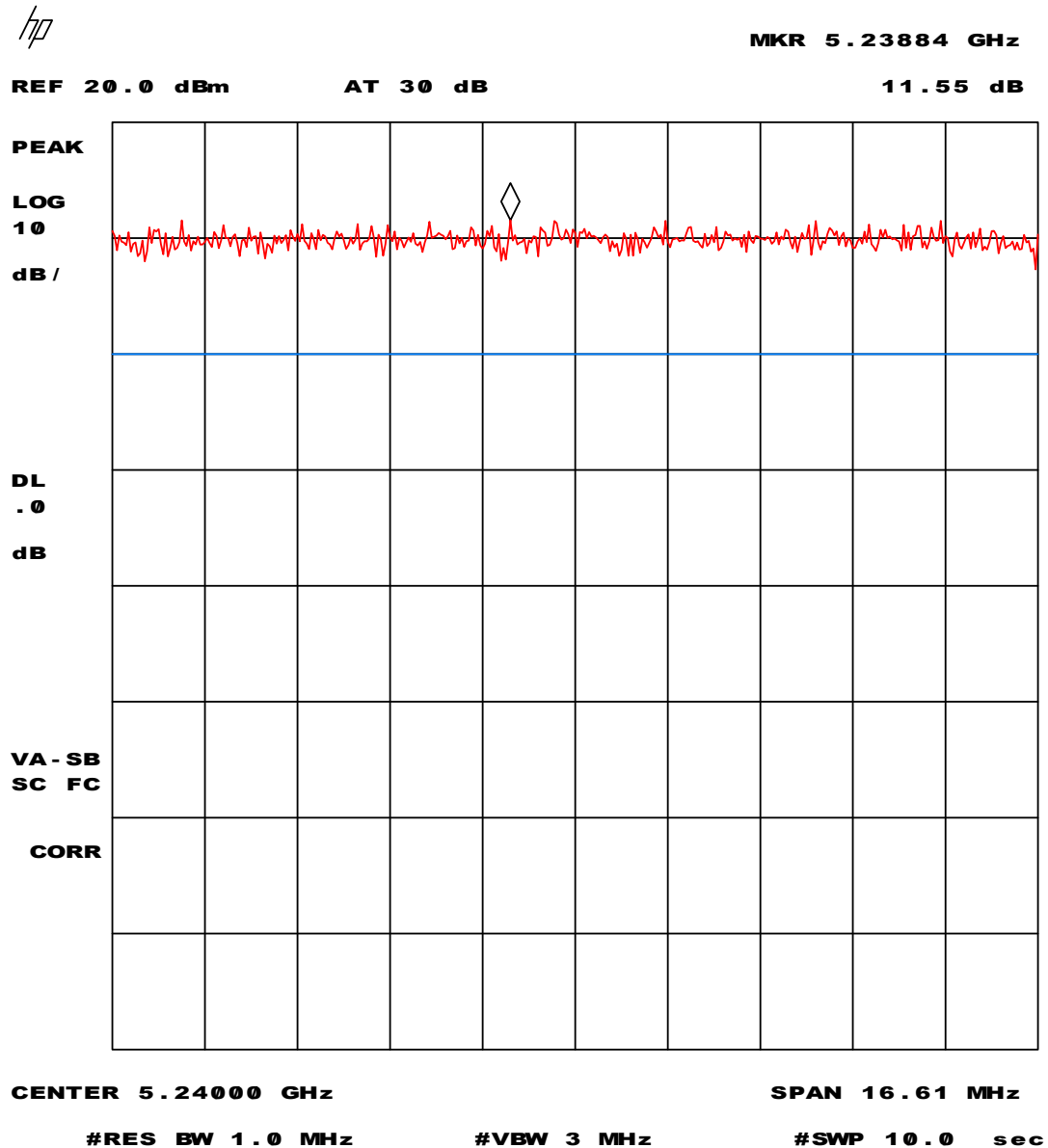


Plot 68 – Ratio of the peak excursion of the modulation envelope.

Plot 68 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 18 Mbit/s.

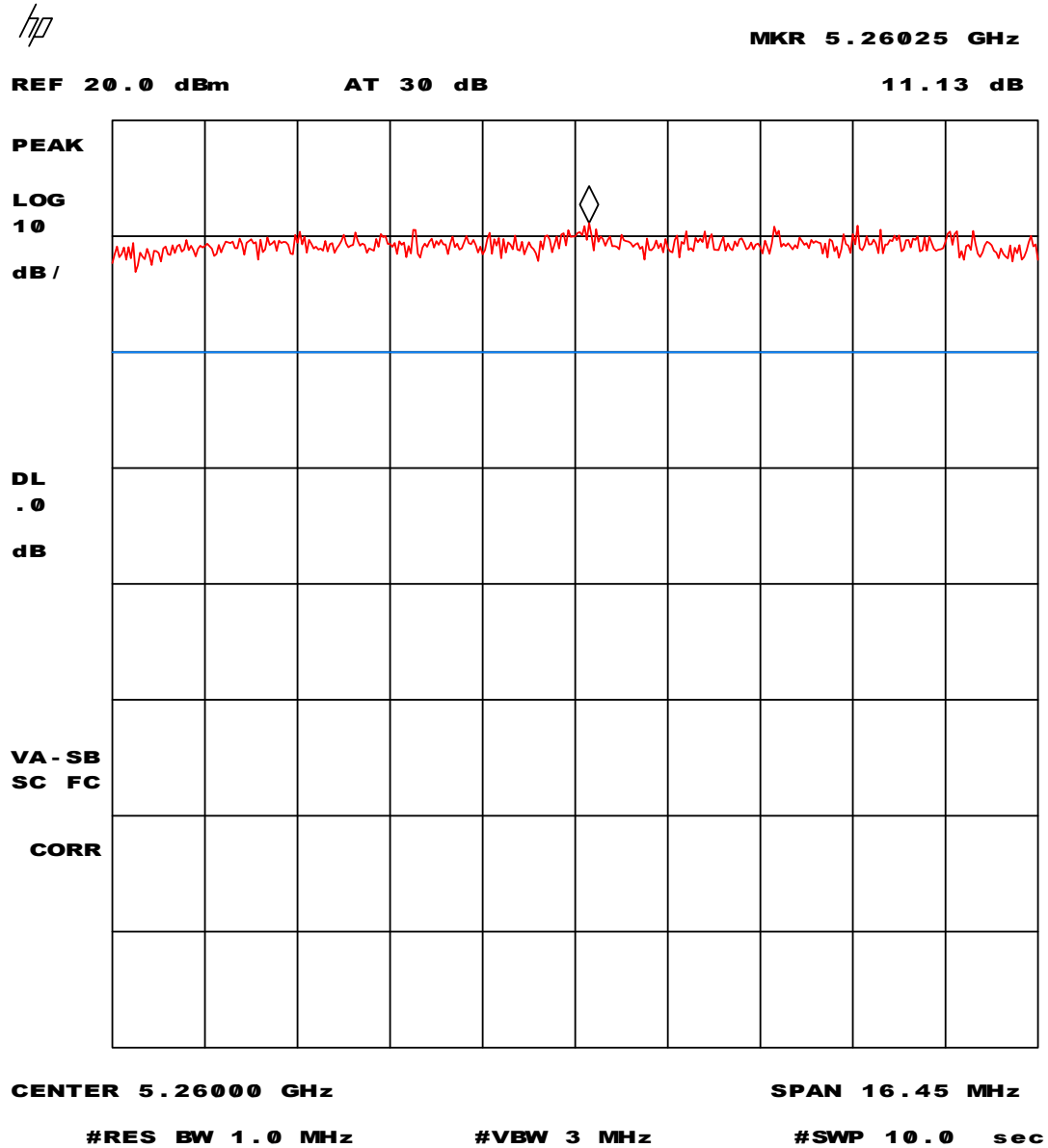


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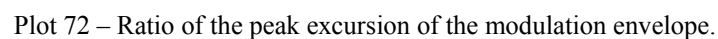
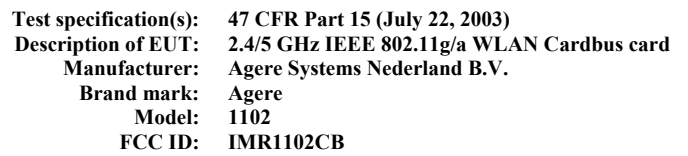
Plot 70 – Ratio of the peak excursion of the modulation envelope.

Plot 70 depicts the ratio of the peak excursion of the modulation envelope with the EUT operating on channel 48 (5240 MHz) and at a transmission bit-rate of 54 Mbit/s.

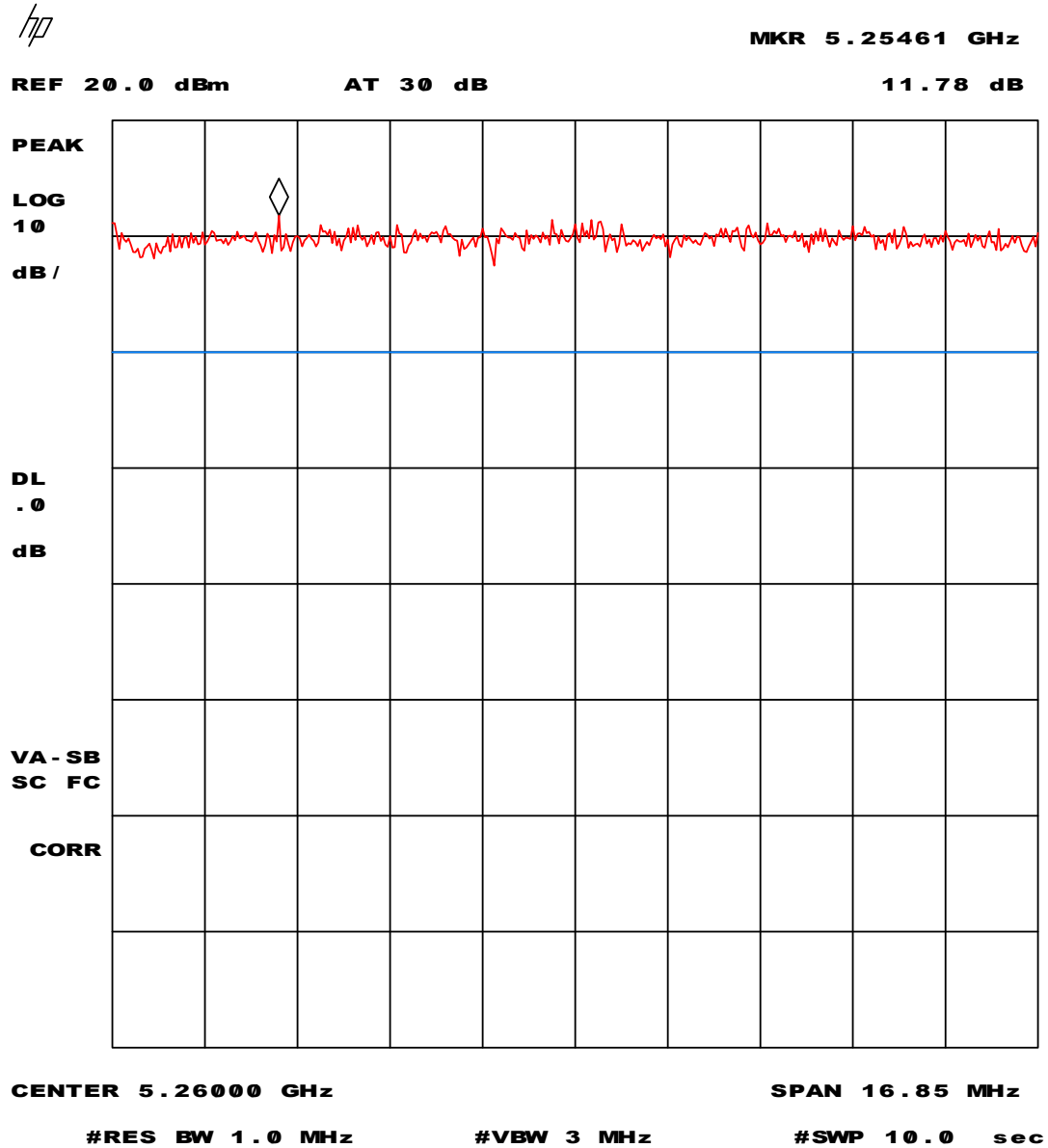


Plot 71 – Ratio of the peak excursion of the modulation envelope.

Plot 71 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.

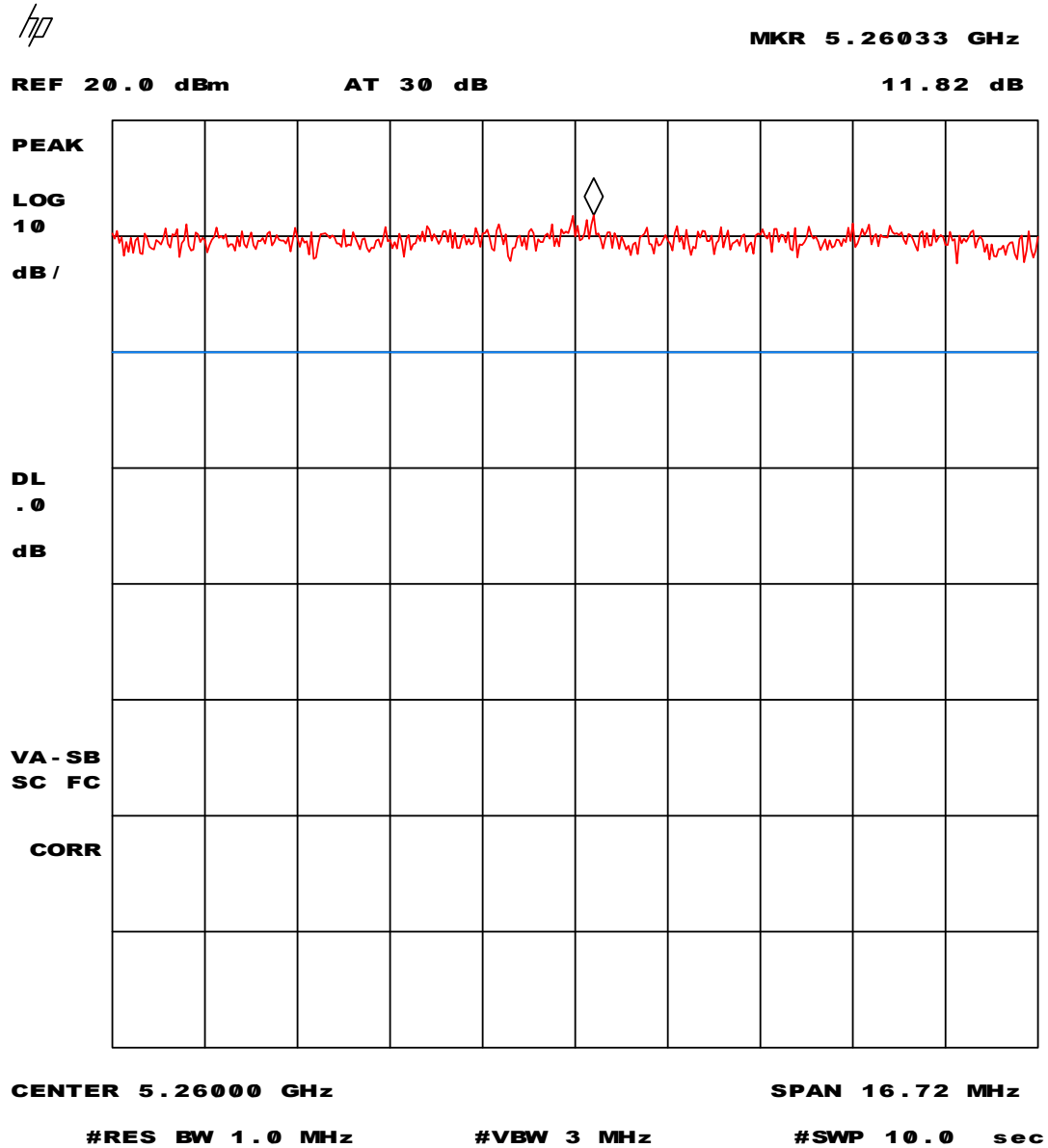


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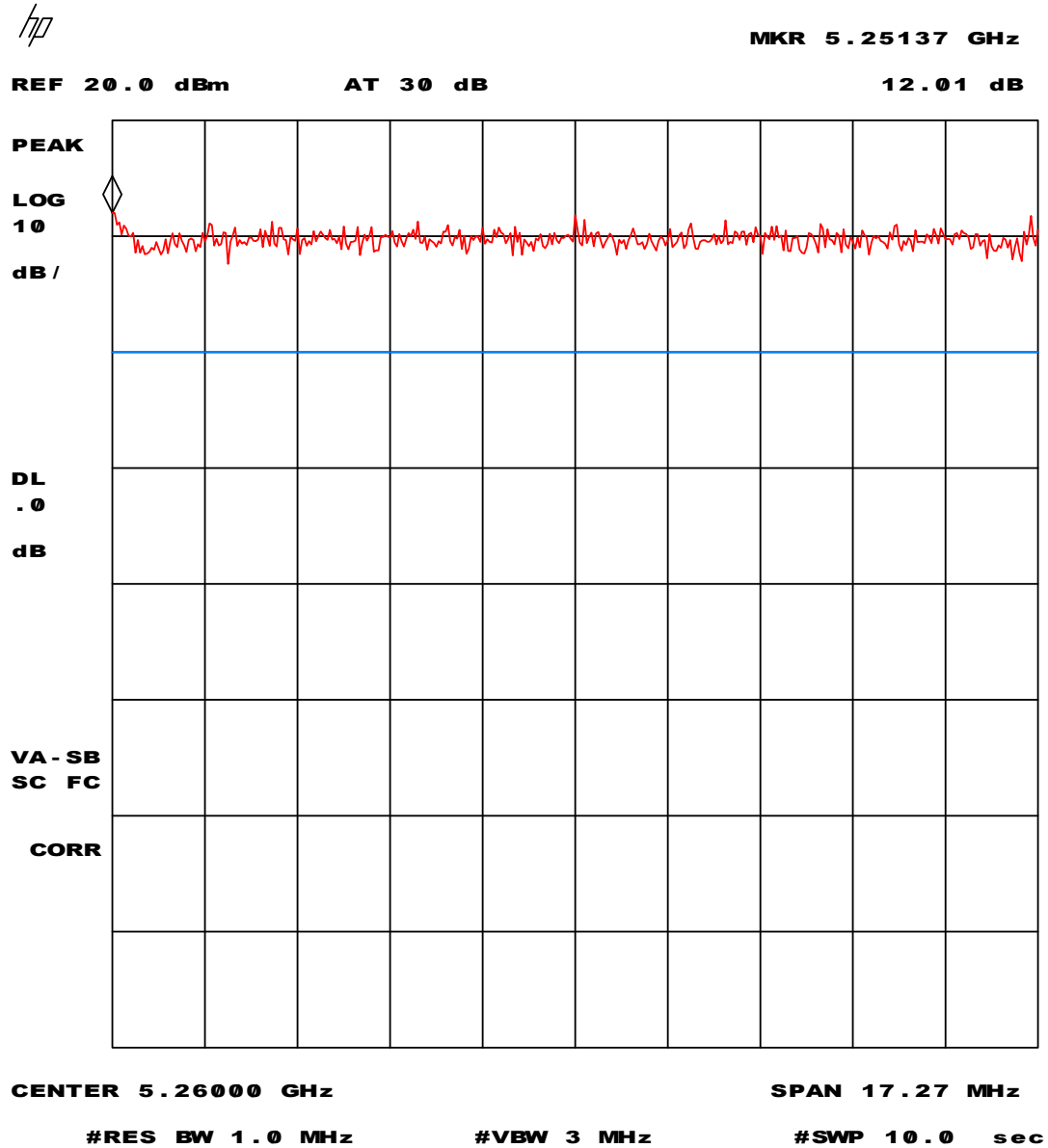
Plot 73 – Ratio of the peak excursion of the modulation envelope.

Plot 73 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 74 – Ratio of the peak excursion of the modulation envelope.

Plot 74 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.

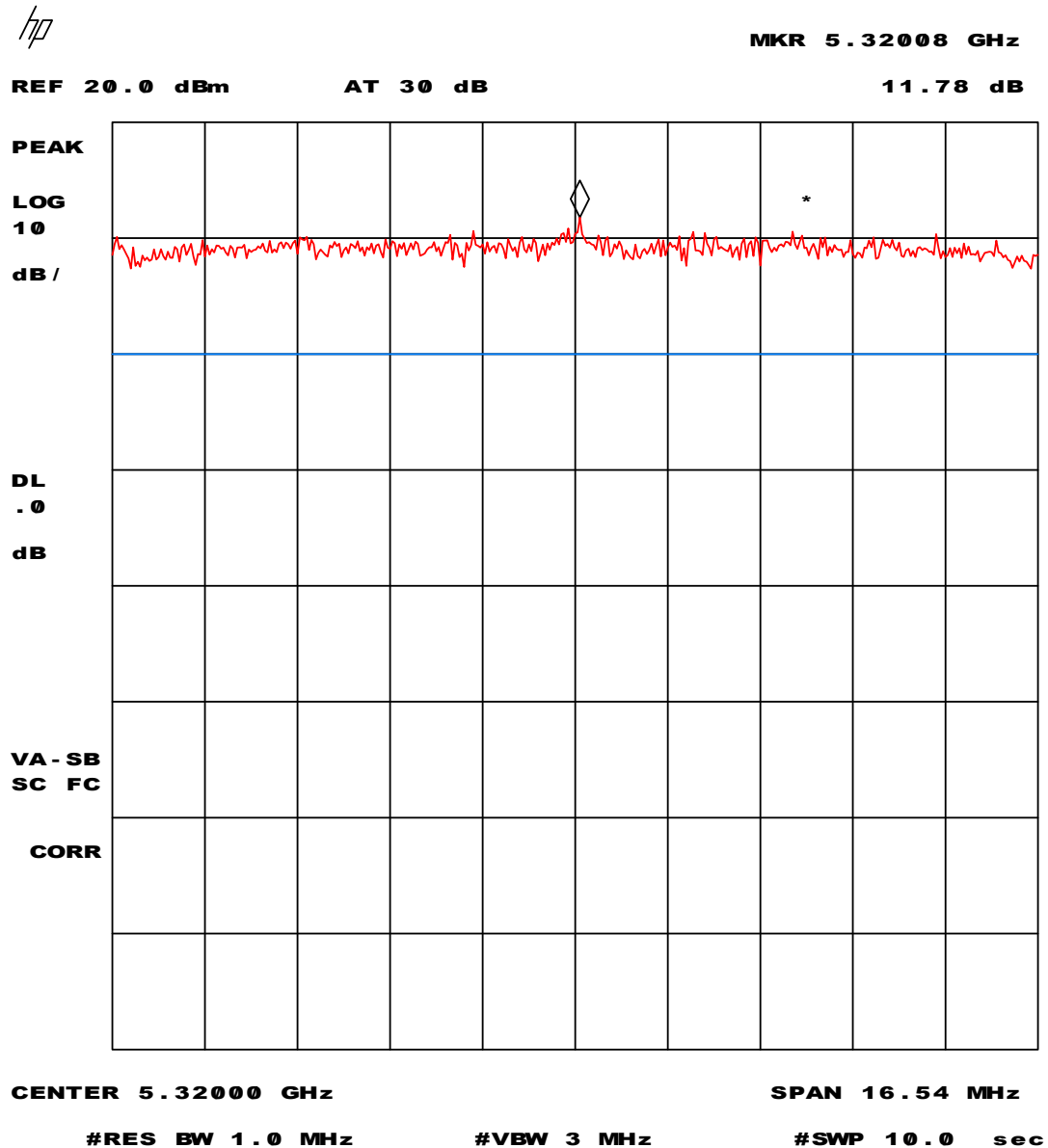


Plot 75 – Ratio of the peak excursion of the modulation envelope.

Plot 75 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.

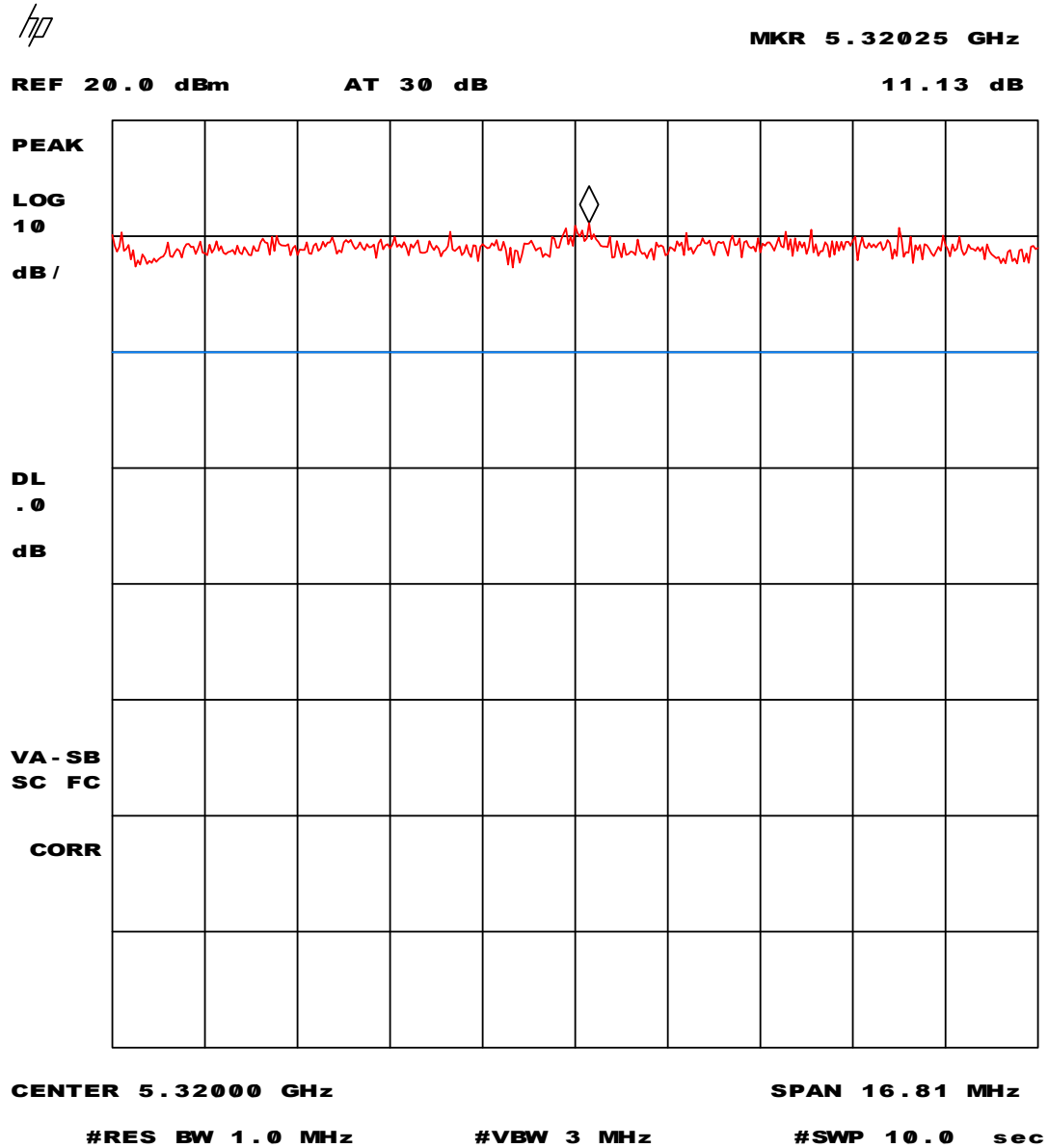


Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB



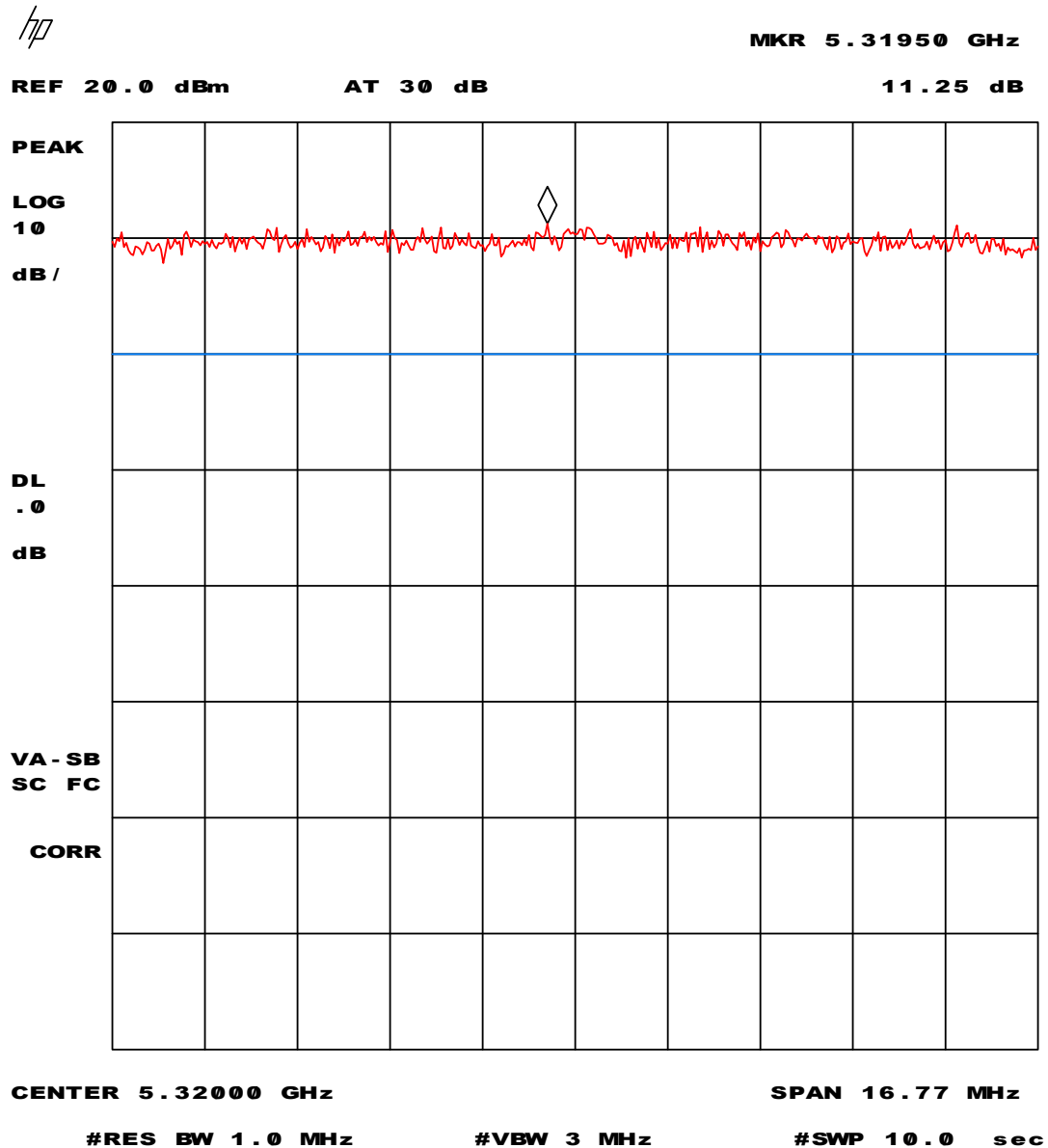
Plot 76 – Ratio of the peak excursion of the modulation envelope.

Plot 76 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.



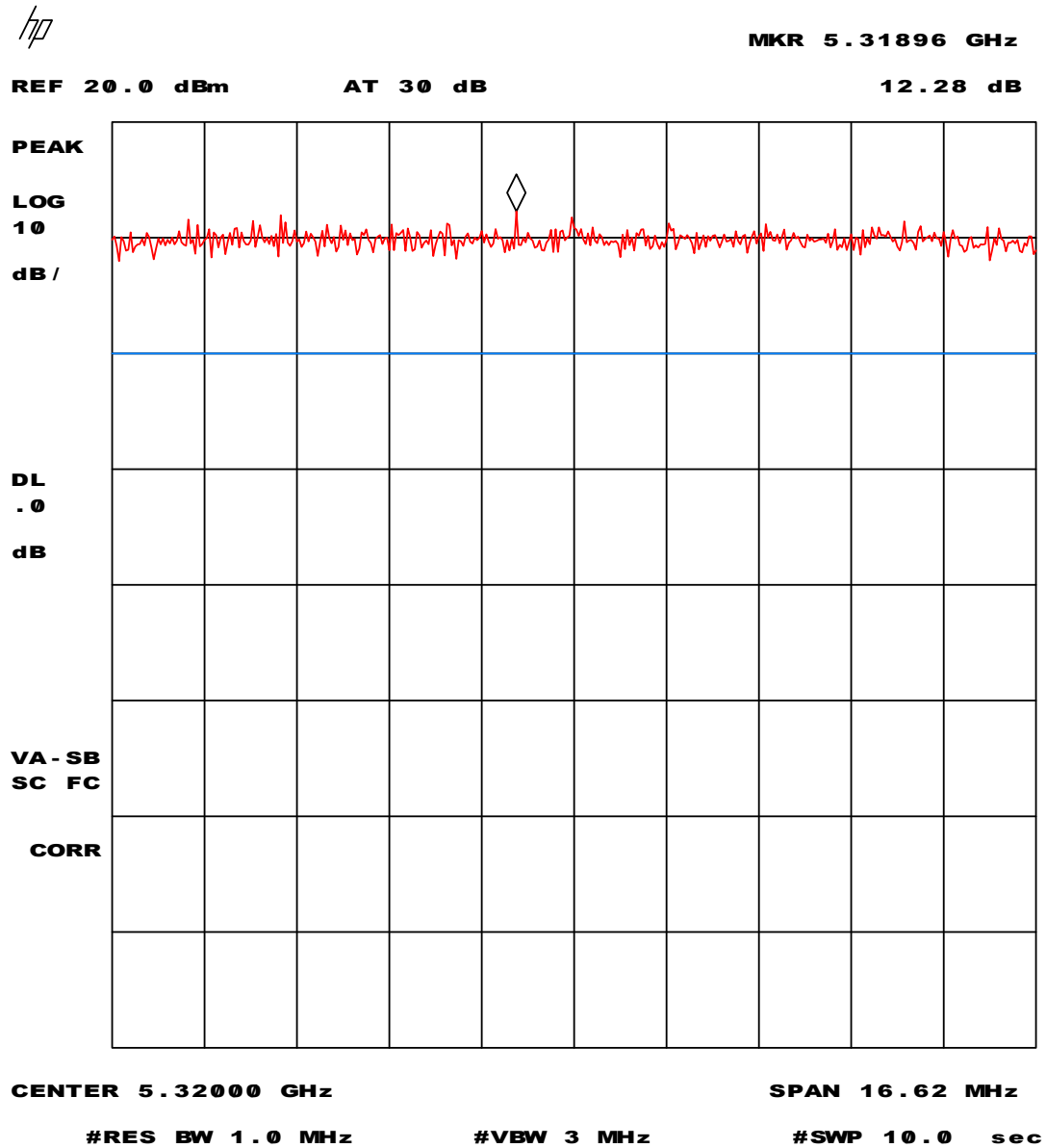
Plot 77 – Ratio of the peak excursion of the modulation envelope.

Plot 77 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.



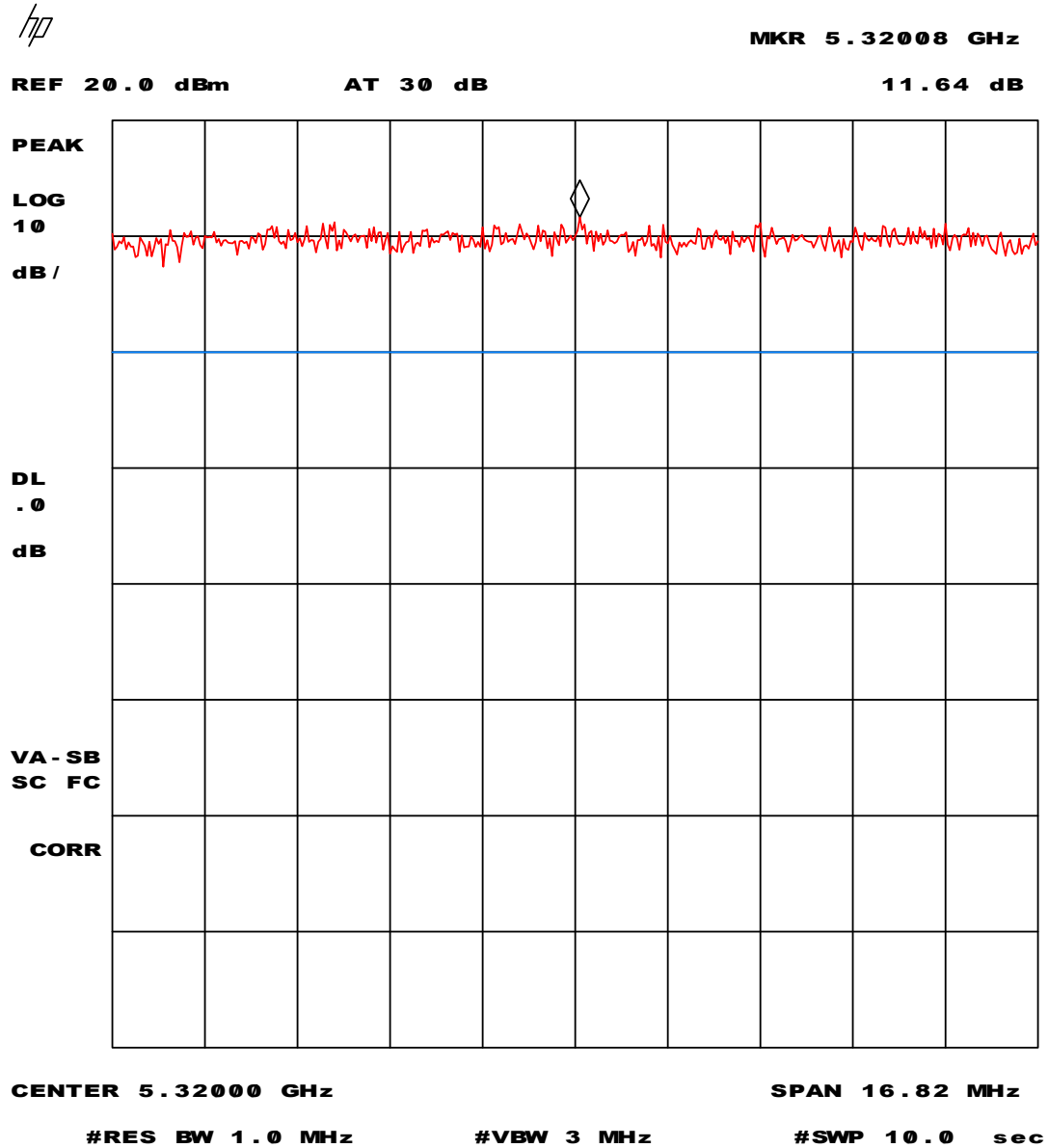
Plot 78 – Ratio of the peak excursion of the modulation envelope.

Plot 78 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 79 – Ratio of the peak excursion of the modulation envelope.

Plot 79 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.

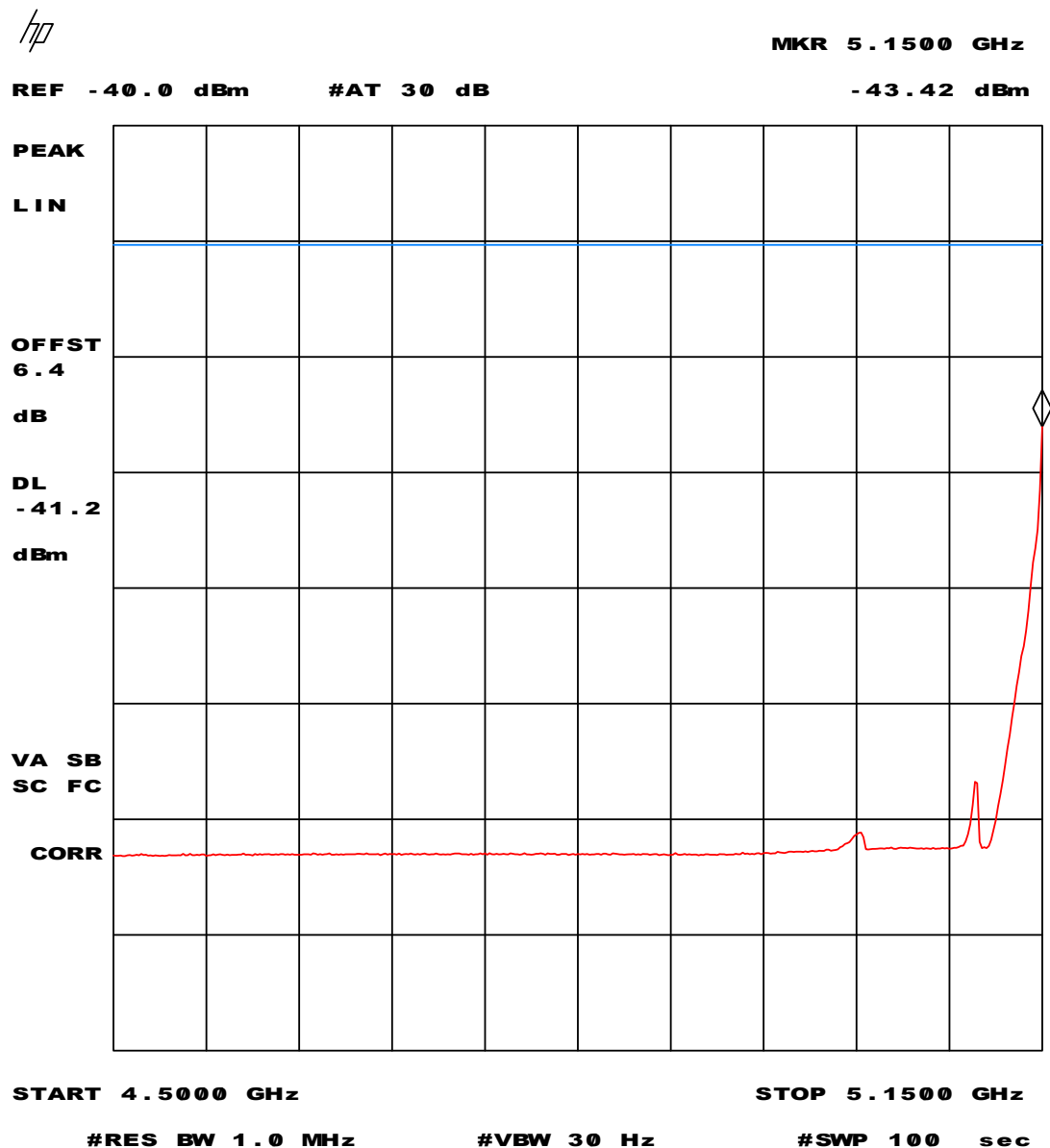


Plot 80 – Ratio of the peak excursion of the modulation envelope.

Plot 80 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.



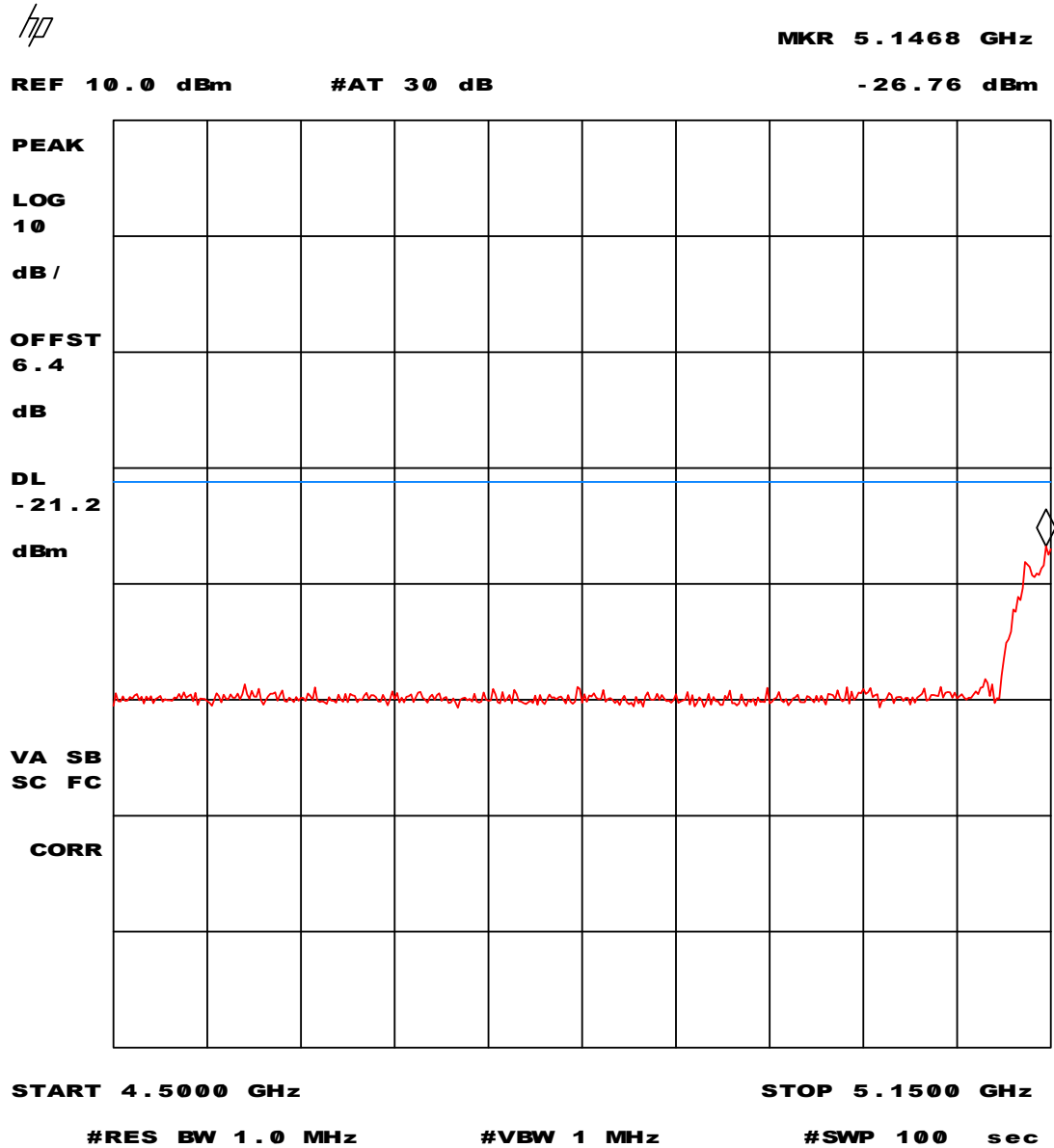
## 5.5 Emission in restricted bands nearest to the band of 5.15 – 5.35 GHz.



Plot 81 – Average measurement values in the 4.50 – 5.15 GHz restricted band of operation

Plot 81 depicts the average measurement values in the restricted band nearest to 5.15 – 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 4.4 dBi antenna gain (including antenna cable losses) and 2.0 dB measurement cable losses.

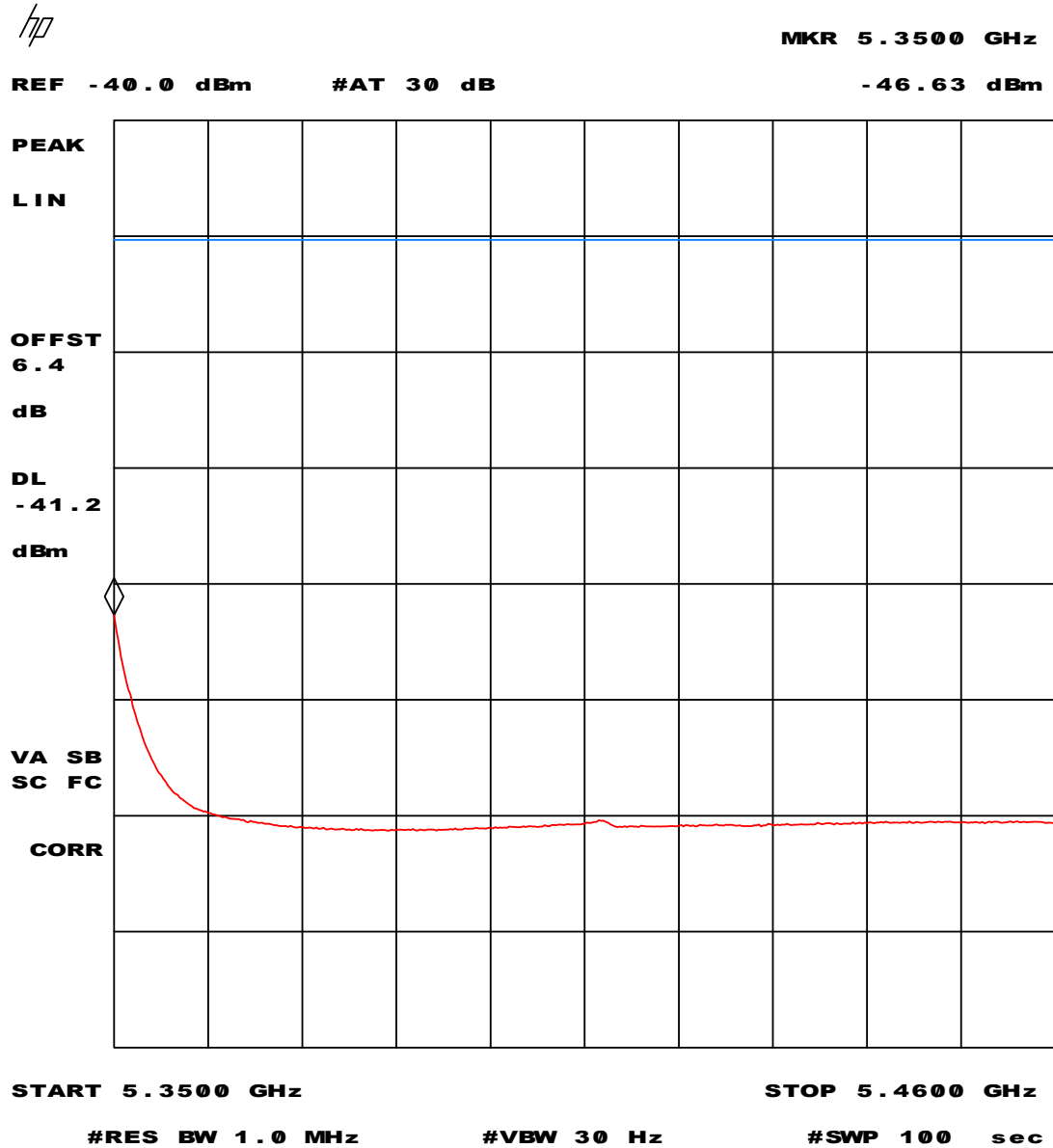
Note: 54 dBμV/m :: -41.2 dBm display line setting.



Plot 82 – Peak measurement values in the 4.50 – 5.15 GHz restricted band of operation

Plot 82 depicts the peak measurement values in the restricted band nearest to 5.15 – 5.35 GHz with the EUT transmitting in 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 4.4 dBi antenna gain (including antenna cable losses) and 2.0 dB measurement cable losses.

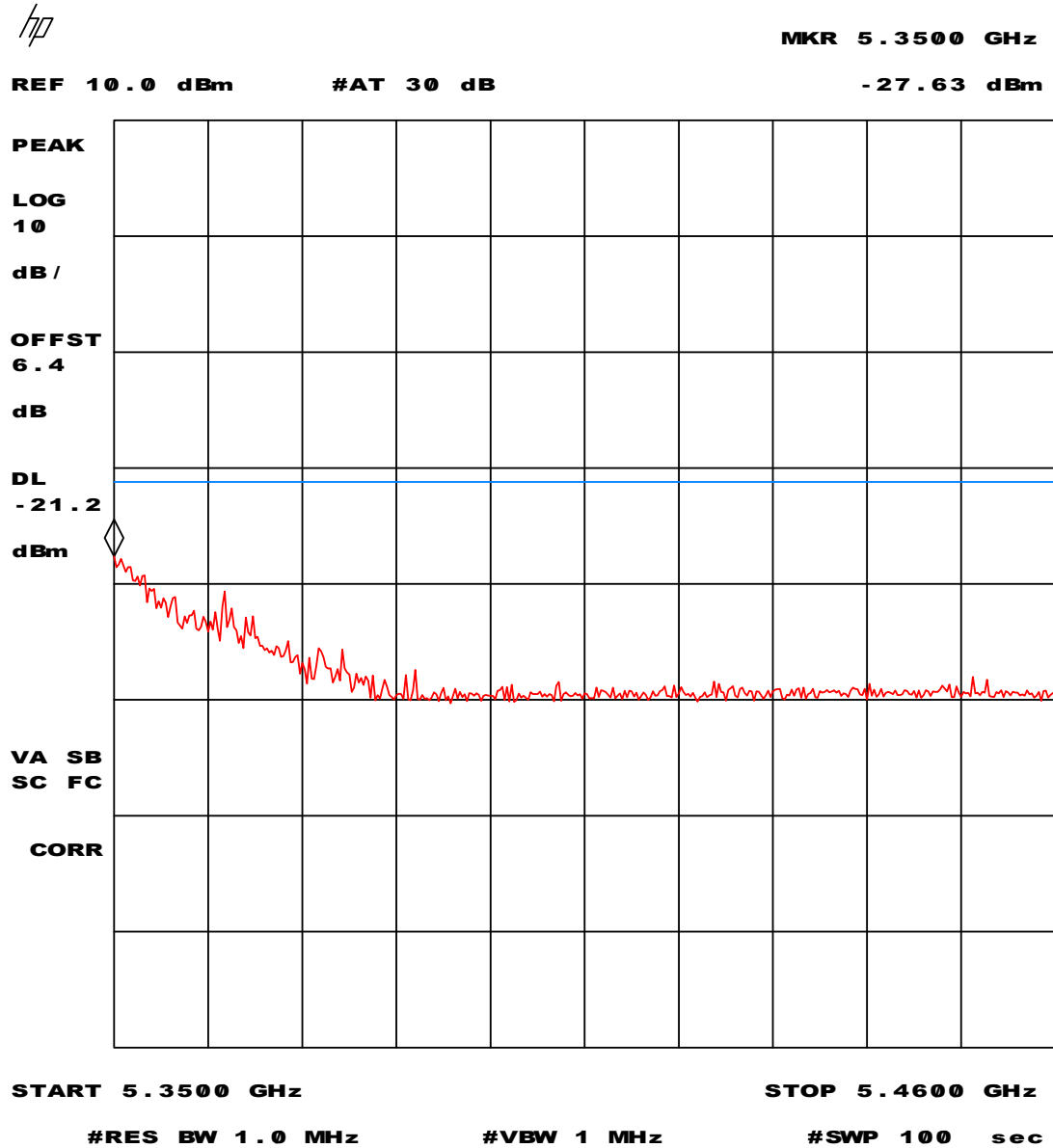
Note: 74 dB $\mu$ V/m :: -21.2 dBm display line setting.



Plot 83 – Average measurement values in the 5.35 – 5.46 GHz restricted band of operation

Plot 83 depicts the average measurement values in the restricted band nearest to 5.35 – 5.46 GHz with the EUT transmitting in 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 4.4 dBi antenna gain (including antenna cable losses) and 2.0 dB measurement cable losses.

Note: 54 dB $\mu$ V/m :: -41.2 dBm display line setting.



Plot 84 – Peak measurement values in the 5.35 – 5.46 GHz restricted band of operation

Plot 84 depicts the peak measurement values in the restricted band nearest to 5.35 – 5.46 GHz with the EUT transmitting in 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 4.4 dBi antenna gain (including antenna cable losses) and 2.0 dB measurement cable losses.

Note: 74 dB $\mu$ V/m :: -21.2 dBm display line setting.



Test specification(s): 47 CFR Part 15 (July 22, 2003)  
Description of EUT: 2.4/5 GHz IEEE 802.11g/a WLAN Cardbus card  
Manufacturer: Agere Systems Nederland B.V.  
Brand mark: Agere  
Model: 1102  
FCC ID: IMR1102CB

## 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                |