# CETECOM ICT Services GmbH

Radio Satellite Communication
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Recognized by the
Federal Communications Commission
**Anechoic chamber registration no.: 90462 (FCC)**
**Anechoic chamber registration no.: 3463 (IC)**
**TCB ID: DE 0001**

Accredited by the
German Accreditation Council
**DAR–Registration Number**
**TTI–P–G 166/98**

Independent ETSI
compliance test house

**Accredited Bluetooth™ Test Facility (BQTF)**

## Test report no.: 4_0902-11-02/03
## FCC Part 24/22/15
## B2003A
## FCC ID: M9H95MYX2A

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## Table of Contents



## 1 General information

### 1.1 Notes

**The test results of this test report relate exclusively to the test item specified in 1.5. The CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of the CETECOM ICT Services GmbH.**

### 1.2 Testing laboratory


CETECOM ICT Services GmbH
Untertürkheimer Straße 6 - 10
66117 Saarbrücken
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Telefone : + 49 681 598 - 9100
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E-mail : info@ict.cetecom.de
Internet : www.cetecom-ict.de


**Accredited testing laboratory**
**The test laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025.**
**DAR registration number: TTI-P-G-166/98**
**Listed by : Federal Communications Commission (FCC)**
**Identification/Registration No : 90462**
**Accredited Bluetooth™ Test Facility (BQTF)**
***BLUETOOTH™ is a trademark owned by Bluetooth SIG, Inc. and licensed to CETECOM***

### 1.3 Details of applicant


**Name : SAGEM SA**
**Street : 2-4, rue du Petit Albi**
**City : F-95800 Cergy Saint-Christophe**
**Country : France**
**Telephone : +33 1 30 73 37 37**
**Telefax : +33 1 34 25 74 16**
**Contact : Mr. Jean Marquet**
**Telephone : +33 1 30 73 37 37**
**e-mail : Jean.marquet@sagem.com**


### 1.4 Application details

Date of receipt of application : 2003-07-31
Date of receipt of test item : 2003-07-31
Date of test : 2003-07-31 –2003-08-05

### 1.5 Test item

| | | |
|---|---|---|
| Type of equipment | : | **Dual Band PCS Mobile Phone (PCS 850/1900 MHz)** |
| Type designation | : | B2003A |
| Manufacturer | : | Sagem SA |
| Street | : | |
| City | : | |
| Country | : | |
| Serial numbers | : | IMEI : 351816950002080, Ser.Nr.: 2232036568<br>IMEI : 351816950001275 for conducted measurement |
| **Additional information:** | **:** | |
| Frequency | : | 1850.2 – 1909.8 MHz and 824.2 – 848.8 MHz |
| Type of modulation | : | 300KGXW / 300KG7W |
| Number of channels | : | 300 (PCS1900) and 125 (PCS850) |
| Antenna | : | Integral antenna |
| Power supply | : | 3,8V DC Li-ion Battery |
| Output power GSM 850 | : | cond.: 33.30 dBm Peak , ERP: 24.20 dBm (Burst);<br>EIRP: 26.30 dBm (Burst) |
| Output power GSM 1900 | : | cond : 30.4 dBm Peak , ERP: 27.61 dBm (Burst);<br>EIRP: 29.71 dBm (Burst) |
| Type of equipment | : | Temperature range : -30°C - +60°C |
| FCC – ID | : | M9H95MYX2A |
| IC | : | |
| Hardware | : | V0x |
| Software | : | J 3,EE |

### 1.6 Test standards: FCC Part 24, 22
**FCC Part 15**

## 2 Technical test

**For Part 24/22 we use the substitution method ( TIA/EIA 603).**

**All measurements in this report are done in GSM mode. Device is able to transmit data in GPRS mode also. But because the current measurements are performed in PEAK mode no other results from GPRS mode are possible. The only different is the modulation average power, which is 3 dB higher (by using 2 timeslots in the Up-link ).**

**Remarks:**
**For AC-conducted measurements we used three different AC chargers,**
**(TA3651-US, 18805593-9 and DTC3515 045E040E).**
**We also tested the phone with a headset (23812517-0), with a cigar lighter adapter (23811253-7) combined with a data cable (23810787-0) .**
**Test setups :**
**Radiated measurements : Car kit A17-BA10-010 and Mobile (IMEI: 351816950002080)**
**Conducted measurements: Mobile ( IMEI : 351816950001275) with every charger**
**EIRP : Mobile (IMEI: 351816950002080)**
**Part15: Mobile (IMEI: 351816950002080) with each part of the ancillary equipment.**

**No deviations from the technical specification(s) were ascertained in the course of the tests performed.**

**FINAL VERDICT: PASS**

**Technical responsibility for area of testing :**

| **2003-08-07** | **RSC 8414** | **Ames H.** | |
|---|---|---|---|
| **Date** | **Section** | **Name** | **Signature** |

**Technical responsibility for area of testing :**

| **2003-08-07** | **RSC8412** | **Hausknecht D.** | |
|---|---|---|---|
| **Date** | **Section** | **Name** | **Signature** |

## 2.2 Test report

**TEST REPORT**

**Test report no. : 4_0902-11-02/03**

**TEST REPORT REFERENCE**

**LIST OF MEASUREMENTS**

**PARAMETER TO BE MEASURED** **PAGE**

## POWER OUTPUT SUBCLAUSE § 24.232

**Summary:**

**This paragraph contains both average , peak output powers and EIRP measurements for the mobile station.**
**In all cases, the peak output power is within the required mask (this mask is specified in the JTC standards, TIA PN3389 Vol. 1 Chap 7, and is no FCC requirement).**

**Method of Measurements:**

**The mobile was set up for the max. output power with pseudo random data modulation.**
**The power was measured with R&S Signal Analyzer FSIQ 26 ( peak and average)**
**This measurements were done at 3 frequencies, 1850,2 MHz, 1880,0 MHz and 1909,8 MHz (bottom, middle and top of operational frequency range)**

**Limits:**

| Power Step | Nominal Peak Output Power (dBm) | Tolerance (dB) |
|---|---|---|
| 0 | +30 | ± 2 |

**Power Measurements:**

**Conducted:**

| Frequency (MHz) | Power Step | Peak Output Power (dBm) | Average Output Power (dBm) |
|---|---|---|---|
| 1850.2 | 0 | 30.30 | 30.20 |
| 1880.0 | 0 | 30.40 | 30.30 |
| 1909.8 | 0 | 30.00 | 29.90 |
| Measurement uncertainty | | ±0.5 dB | |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
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**EIRP Measurements**

Description: This is the test for the maximum radiated power from the phone.
Rule Part 24.232(b) specifies that "Mobile/portable stations are limited to 2 watts e.i.r.p. peak power…" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."
Method of Measurement:
1. In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference center of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.
2. A "reference path loss" is established as Pin + 2.1 - Pr.
3. The EUT is substituted for the dipole at the reference centre of the chamber. The EUT is put into CW test mode and a scan is performed to obtain the radiation pattern.
4. From the radiation pattern, the co-ordinates where the maximum antenna gain occurs is identified.
5. The EUT is then put into pulse mode at its maximum power level (Power Step 0).
6. "Gated mode" power measurements are performed with the receiving antenna placed at the co-ordinates determined in Step 3 to determine the output power as defined in FCC Rule 24.232 (b) and (c). The "reference path loss" from Step 1 is added to this result.
7. This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.1 dBi) and known input power (Pin).
8. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.1dBi.

**Limits:**

| Power Step | Burst PEAK EIRP (dBm) |
|---|---|
| 0 | <33 |

**Power Measurements ( Radiated )**

| Frequency (MHz) | Power Step | BURST PEAK (dBm) | | MODULATION AVERAGE (dBm) | |
|---|---|---|---|---|---|
| | | EIRP | ERP | EIRP | ERP |
| 1850.2 | 0 | 29.60 | 27.50 | 23.60 | 21.40 |
| 1880.0 | 0 | 29.71 | 27.61 | 23.71 | 21.61 |
| 1909.8 | 0 | 29.11 | 27.01 | 23.11 | 21.01 |
| Measurement uncertainty | | ±3 dB | | | |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
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## FREQUENCY STABILITY SUBCLAUSE § 24.235

**Method of Measurement:**

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the mobile station in a “call mode”. This is accomplished with the use of a R&S CMU 200 DIGITAL RADIOCOMMUNICATION TESTER..

1. Measure the carrier frequency at room temperature.
2. Subject the mobile station to overnight soak at -30 C.
3. With the mobile station, powered with 3.6 Volts, connected to the CMU 200 and in a simulated call on channel 661 (centre channel), measure the carrier frequency. These measurements should be made within 2 minutes of powering up the mobile station, to prevent significant self warming.
4. Repeat the above measurements at 10 C increments from -30 C to +60 C. Allow at least 1 1/2 hours at each temperature, un-powered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal 3.8 Volts. Vary supply voltage from minimum 3.3 Volts to maximum 4.4 Volts, in 12 steps re-measuring carrier frequency at each voltage. Pause at 3.8 V dc Volts for 1 1/2 hours un-powered, to allow any self heating to stabilize, before continuing.
6. Subject the mobile station to overnight soak at +60 C.
7. With the mobile station, powered with 3.8 Volts, connected to the CMU 200 and in a simulated call on channel 661(center channel), measure the carrier frequency. These measurements should be made within 2 minutes of powering up the mobile station, to prevent significant self warming.
8. Repeat the above measurements at 10 C increments from +60 C to -30 C. Allow at least 1 1/2 hours at each temperature, un-powered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5 C during the measurement procedure.

**Measurement Limit:**

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.. This transceiver is specified to operate with an input voltage of between 3.3 V dc and 4.4 V dc, with a nominal voltage of 3.8 V dc.

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
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**AFC FREQ ERROR vs. VOLTAGE**

| Voltage (V) | Frequency Error (Hz) | Frequency Error (%) | Frequency Error (ppm) |
|---|---|---|---|
| 3.3 | 42 | 0,00000223 | 0,0223 |
| 3.4 | 39 | 0,00000207 | 0,0207 |
| 3.5 | 31 | 0,00000165 | 0,0165 |
| 3.6 | 29 | 0,00000154 | 0,0154 |
| 3.7 | 26 | 0,00000138 | 0,0138 |
| 3.8 | 26 | 0,00000138 | 0,0138 |
| 3.9 | 27 | 0,00000144 | 0,0144 |
| 4.0 | 29 | 0,00000154 | 0,0154 |
| 4.1 | 29 | 0,00000154 | 0,0154 |
| 4.2 | 24 | 0,00000128 | 0,0128 |
| 4.3 | 23 | 0,00000122 | 0,0122 |
| 4.4 | 31 | 0,00000165 | 0,0165 |

**AFC FREQ ERROR vs. TEMPERATURE**

| TEMPERATURE (°C) | Frequency Error (Hz) | Frequency Error (%) | Frequency Error (ppm) |
|---|---|---|---|
| -30 | -30 | 0,00000223 | 0,0223 |
| -20 | -2 | 0,00000207 | 0,0207 |
| -10 | 11 | 0,00000165 | 0,0165 |
| ±0.0 | 23 | 0,00000154 | 0,0154 |
| +10 | 22 | 0,00000138 | 0,0138 |
| +20 | 26 | 0,00000138 | 0,0138 |
| +30 | 28 | 0,00000144 | 0,0144 |
| +40 | 32 | 0,00000154 | 0,0154 |
| +50 | 32 | 0,00000154 | 0,0154 |
| +60 | 32 | 0,00000128 | 0,0128 |
| | | | |
| | | | |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
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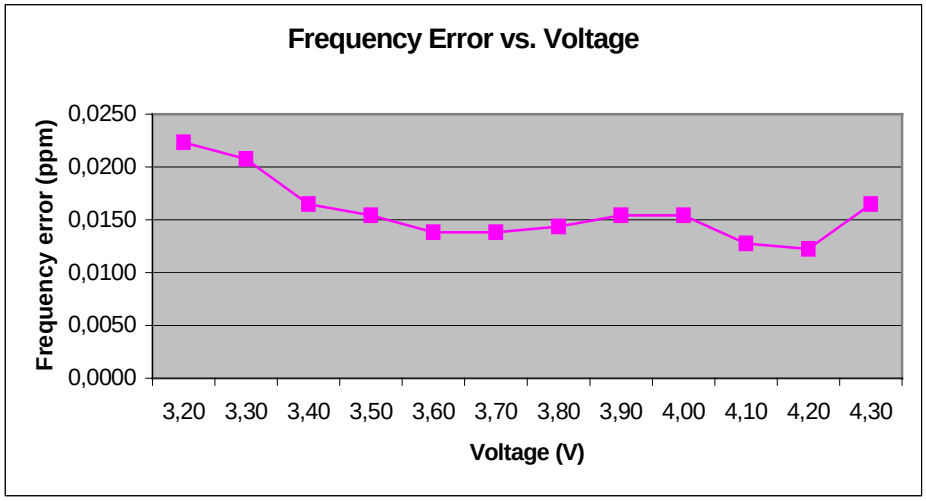


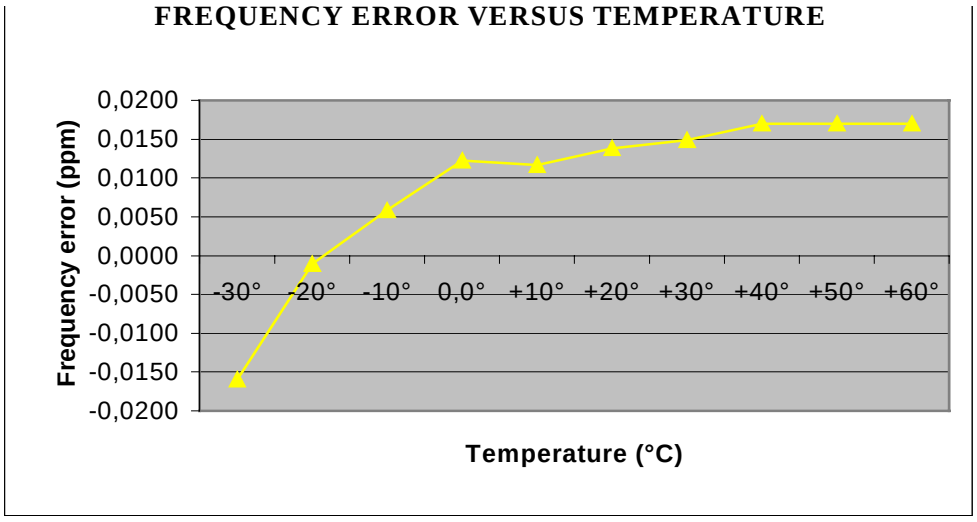


**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

## EMISSIONS LIMITS §24.238

**Measurement Procedure:**

The following steps outline the procedure used to measure the radiated emissions from the mobile station. The site is constructed in accordance with ANSI C63.4 – 1992 requirements and is recognised by the FCC to be in compliance for a 3 and a 10 meter site. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 1910 MHz. This was rounded up to 20 GHz. The resolution bandwidth is set as outlined in Part 24.238. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the USPCS band.

**The final open field emission ( here 10m semi-anechoic chamber listed by FCC) test procedure is as follows:**
a) The test item was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna.
b) The antenna output was terminated in a 50 ohm load.
c) A double ridged waveguide antenna was placed on an adjustable height antenna mast 3 meters from the test item for emission measurements.
d) Detected emissions were maximized at each frequency by rotating the test item and adjusting the receive antenna height and polarization. The maximum meter reading was recorded. The radiated emission measurements of the harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and I MHz bandwidth. If the harmonic could not be detected above the noise floor, the ambient level was recorded.
e) Now each detected emissions were substituted by the Substitution method, in accordance with the TIA/EIA 603.

**Measurement Limit:**
Sec. 24.238 Emission Limits.
(a) On any frequency outside a licensee' s frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

**Measurement Results:**
Radiated emissions measurements were made only at the upper, center, and lower carrier frequencies of the USPCS band (1850.2 MHz, 1879.8 MHz and 1909.8 MHz). It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the USPCS band into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

**RESULTS OF OPEN FIELD RADIATED TEST FOR FCC-24:**
The final open field radiated levels are presented on the next pages.
**All measurements were done in horizontal and vertical polarization, the plots show the worst case.**
**As can be seen from this data, the emissions from the test item were within the specification limit.**

**RESULTS OF OPEN FIELD RADIATED TEST FOR FCC-24:**

| EMISSION LIMITATIONS | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| **f (MHz)** | | **amplitude of emission (dBm)** | **limit max. allowed emission power (dBm)** | **actual attenuation below frequency of operation (dBc)** | **results** |
| **CH 512** | | | | | |
| **1850.2** | | **29.60** | **-13.0 (42.60 dBc)** | | **carrier** |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **CH 661** | | | | | |
| **1880.0** | | **29.71** | **-13.0 (42.71 dBc)** | | **carrier** |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **CH 810** | | | | | |
| **1909.8** | | **29.11** | **-13.0 (42.11 dBc)** | | **carrier** |
| **9556.0** | | **-34.3** | | **63.41** | **complies** |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| **Measurement uncertainty** | | | **± 0.5dB** | | |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
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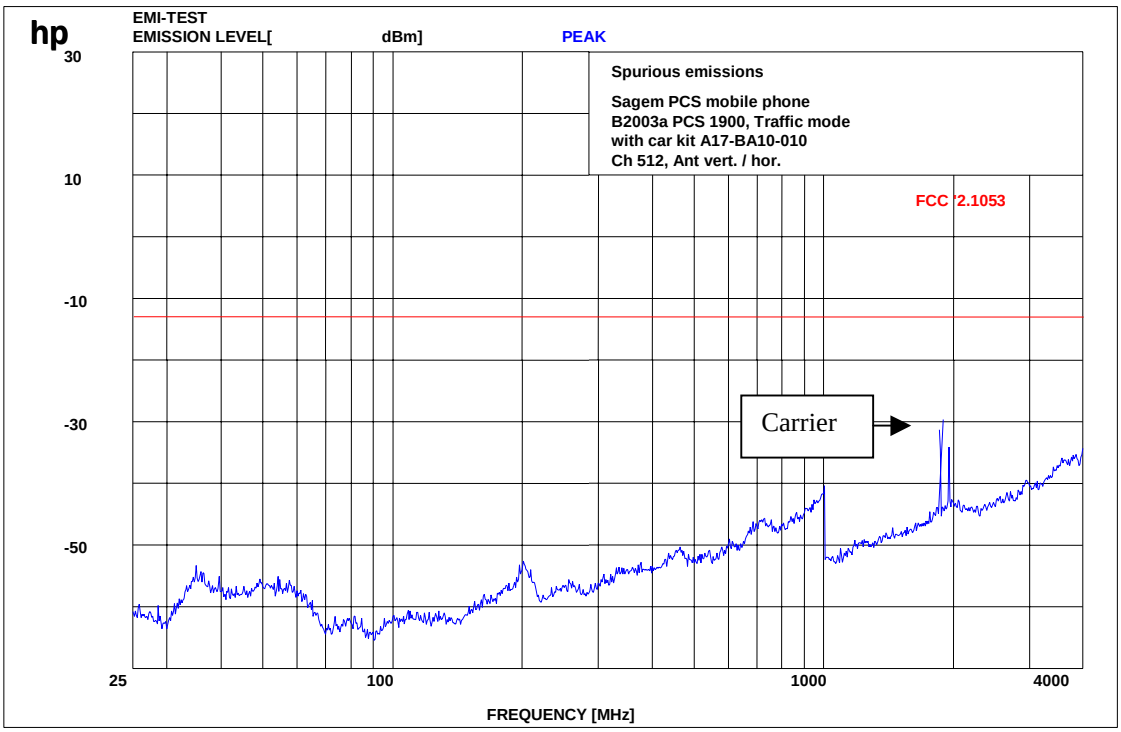
**Channel 512 (up to 4 GHz )**




**f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW / VBW 1 MHz**

**Carrier suppressed with a rejection filter**
**The second peak at the right side of the carrier is the signal from the base station simulator.**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
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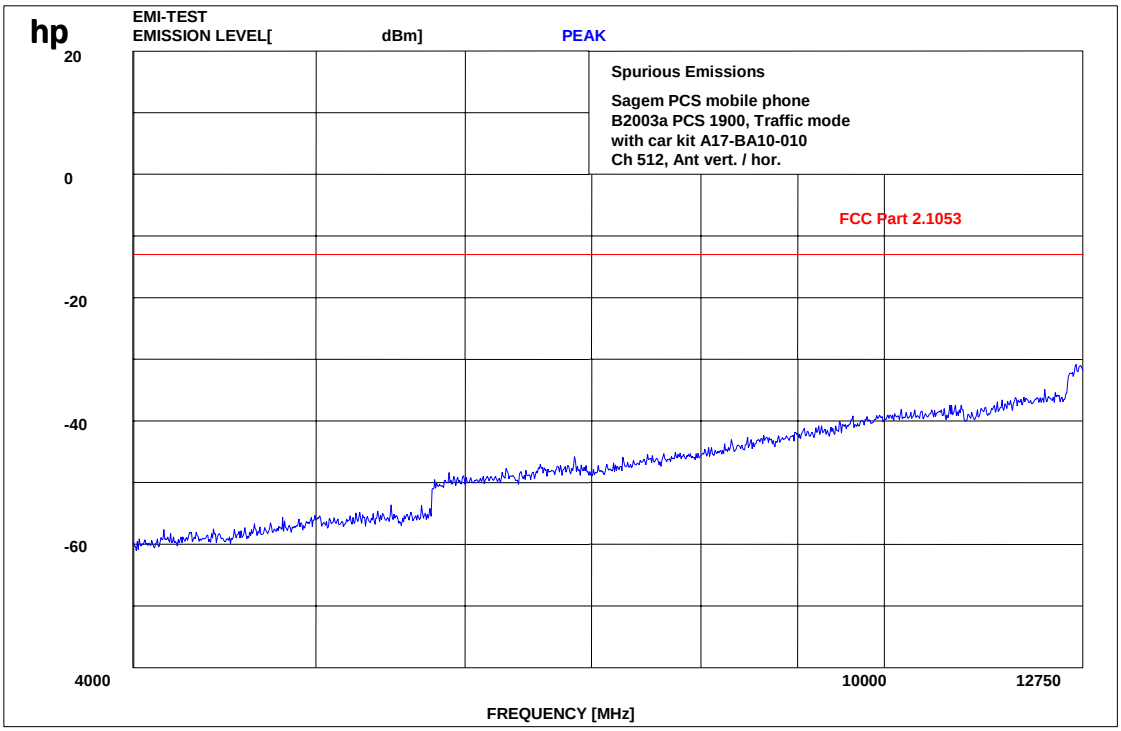
## Channel 512 (up to 12 GHz )




**f < 1 GHz : RBW/VBW: 100 kHz** **f ≥ 1GHz : RBW / VBW 1 MHz**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
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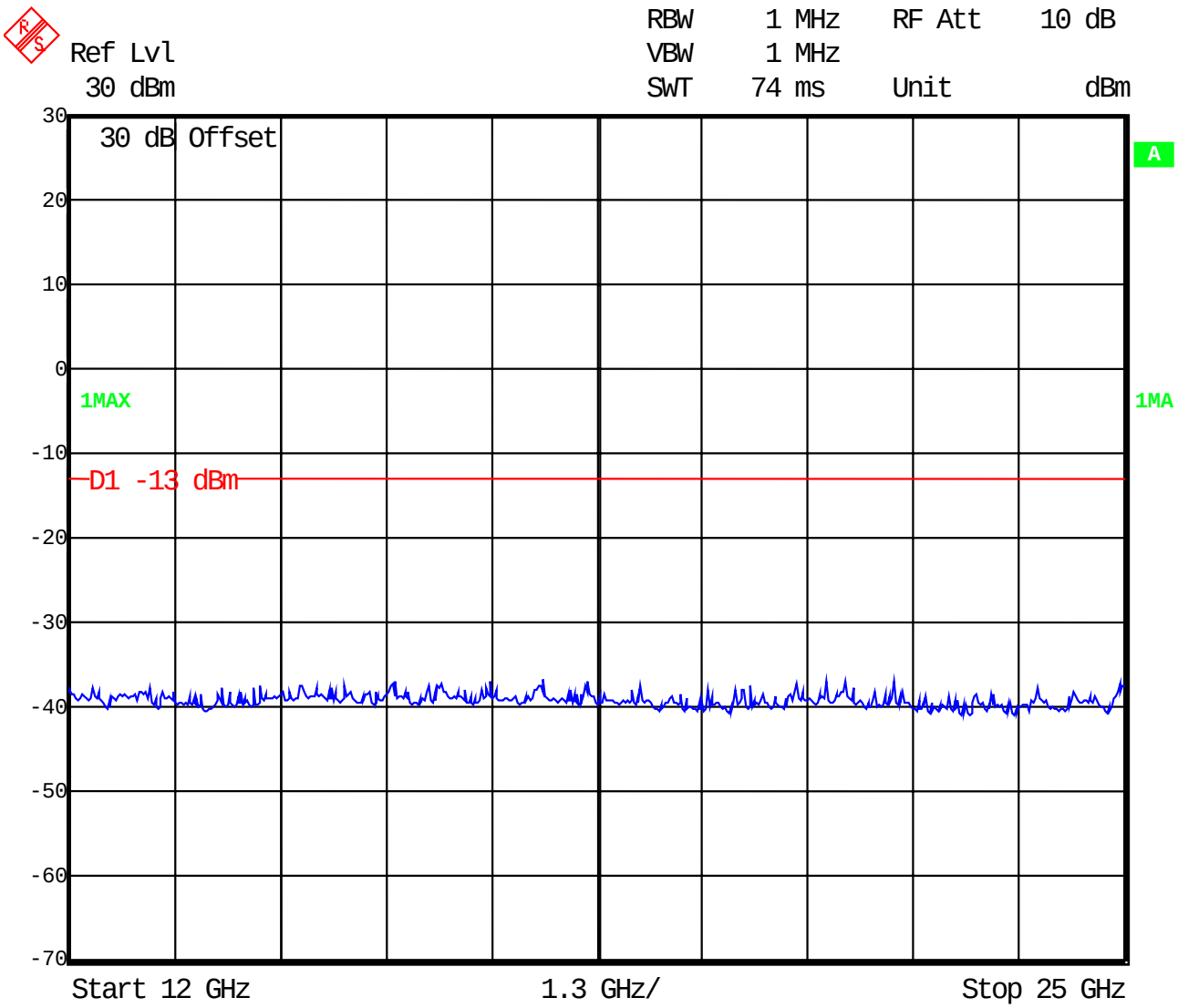
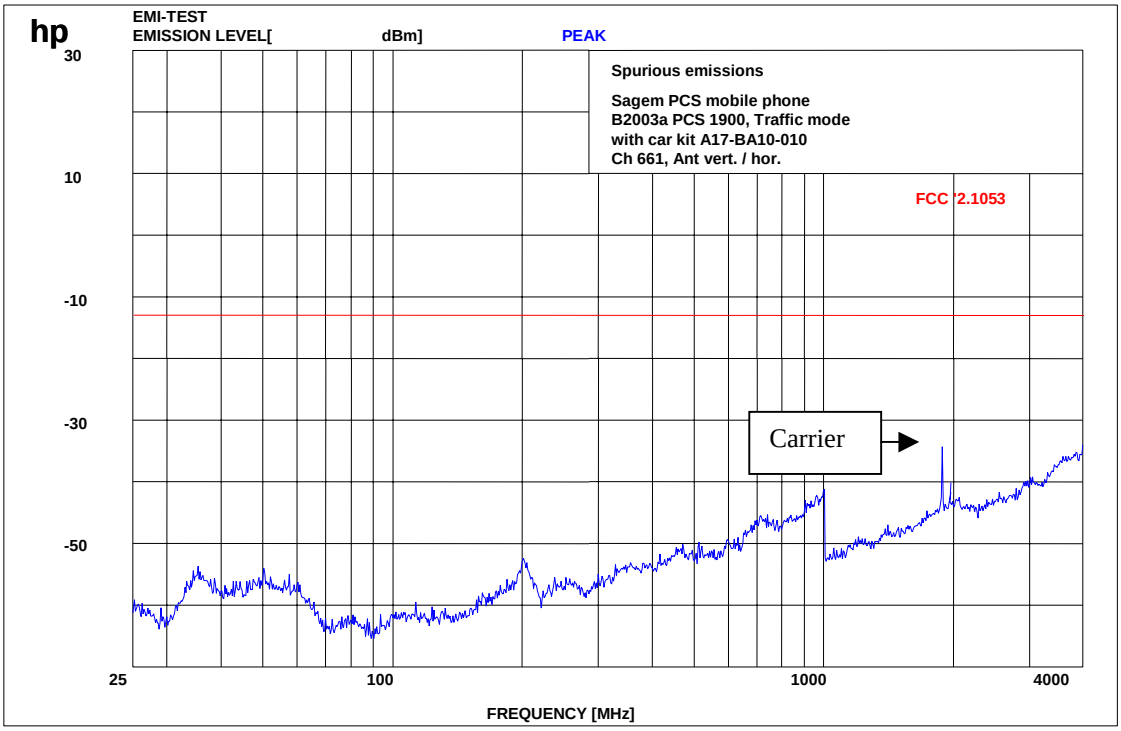
**Channel 512 :– 25 GHz**




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

## Channel 661 (up to 4 GHz )




**f < 1 GHz : RBW/VBW: 100 kHz** **f ≥ 1GHz : RBW / VBW 1 MHz**

**Carrier suppressed with a rejection filter.**
**The second peak at the right side of the carrier is the signal from the base station simulator.**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
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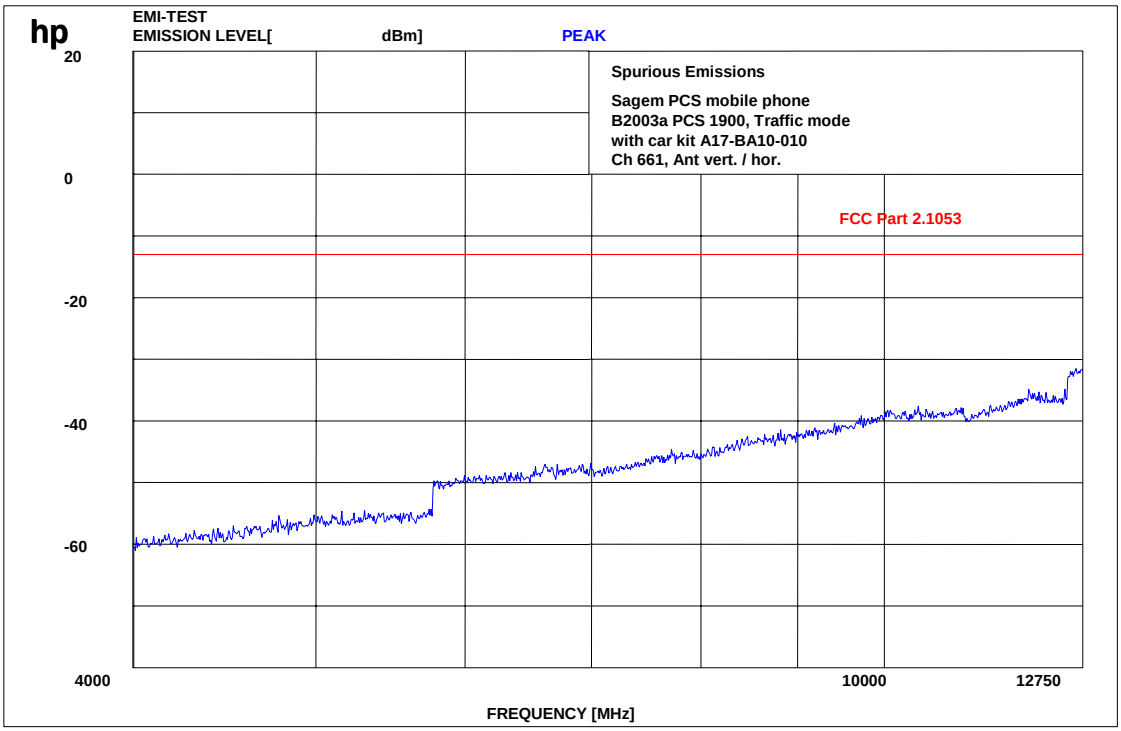
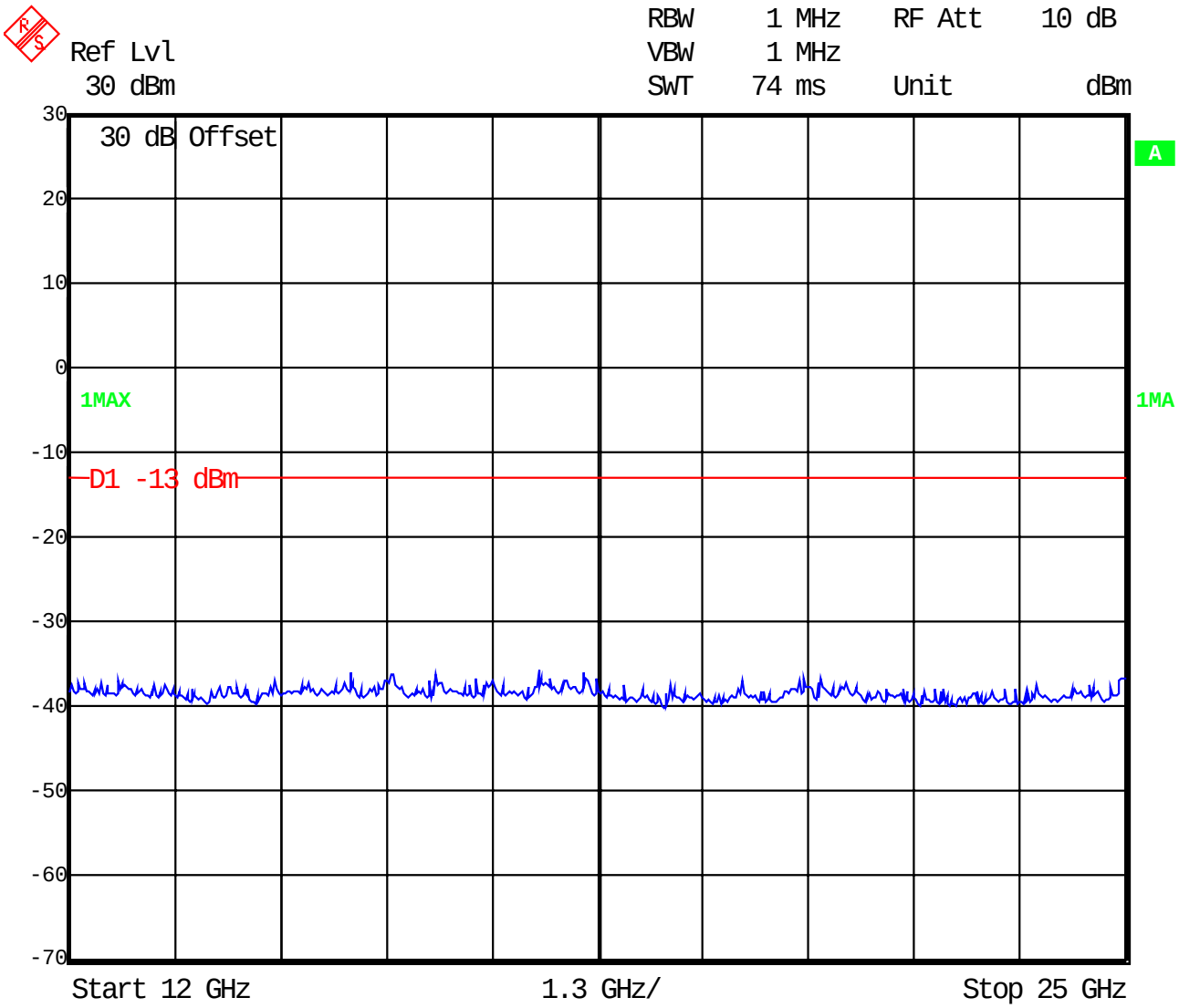
## Channel 661 (up to 12 GHz )




**f < 1 GHz : RBW/VBW: 100 kHz** **f ≥ 1GHz : RBW / VBW 1 MHz**

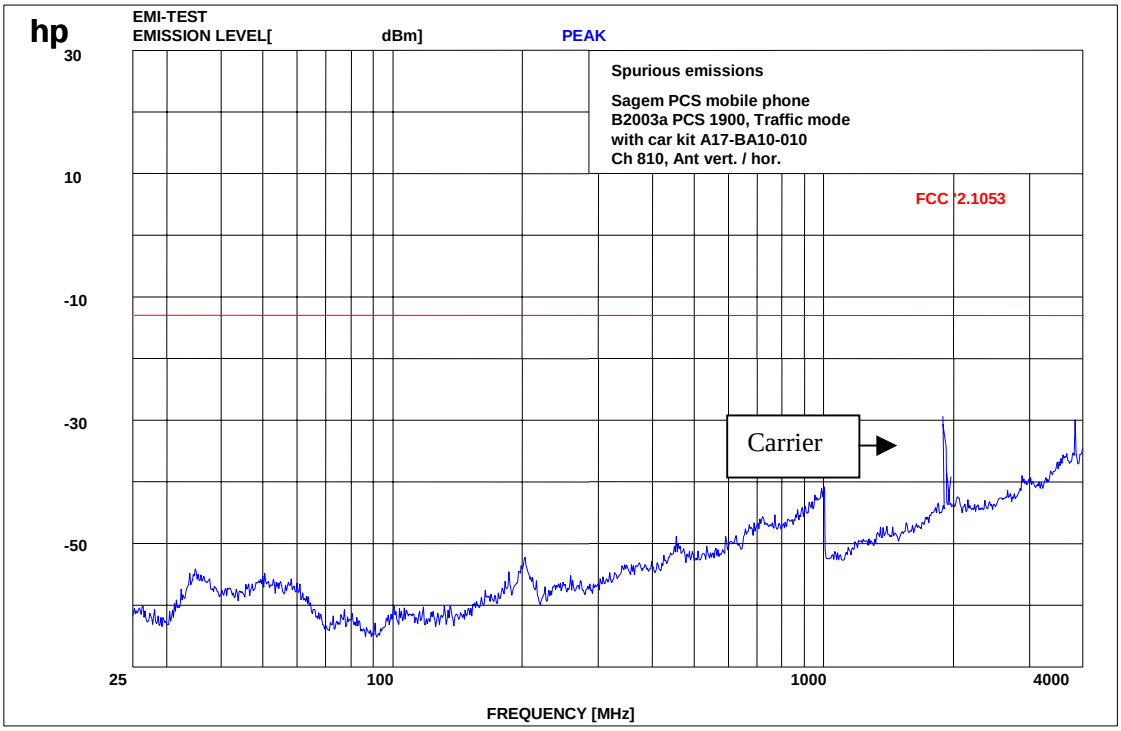
**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

**Channel 661 : -25 GHz**




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

## Channel 810 up to 4 GHz

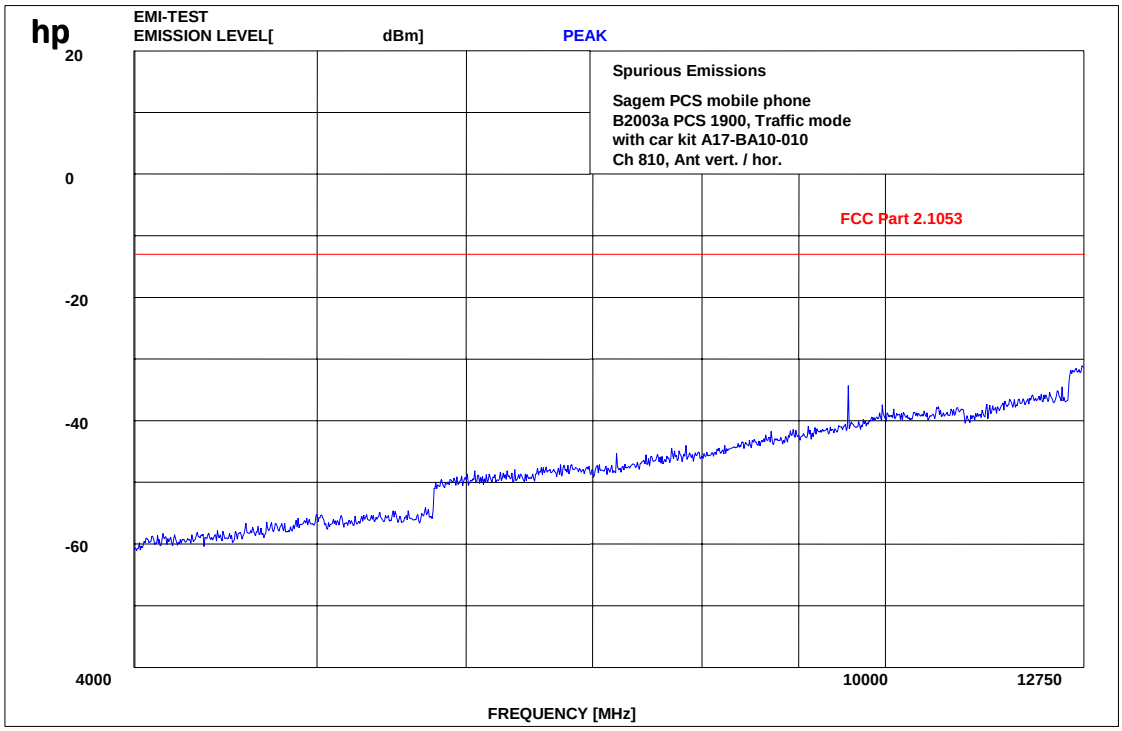



**f < 1 GHz : RBW/VBW: 100 kHz** **f ≥ 1GHz : RBW / VBW 1 MHz**

## Carrier suppressed with a rejection filter

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## Channel 810 up to 12 GHz




**f < 1 GHz : RBW/VBW: 100 kHz** **f ≥ 1GHz : RBW/VBW 1 MHz**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
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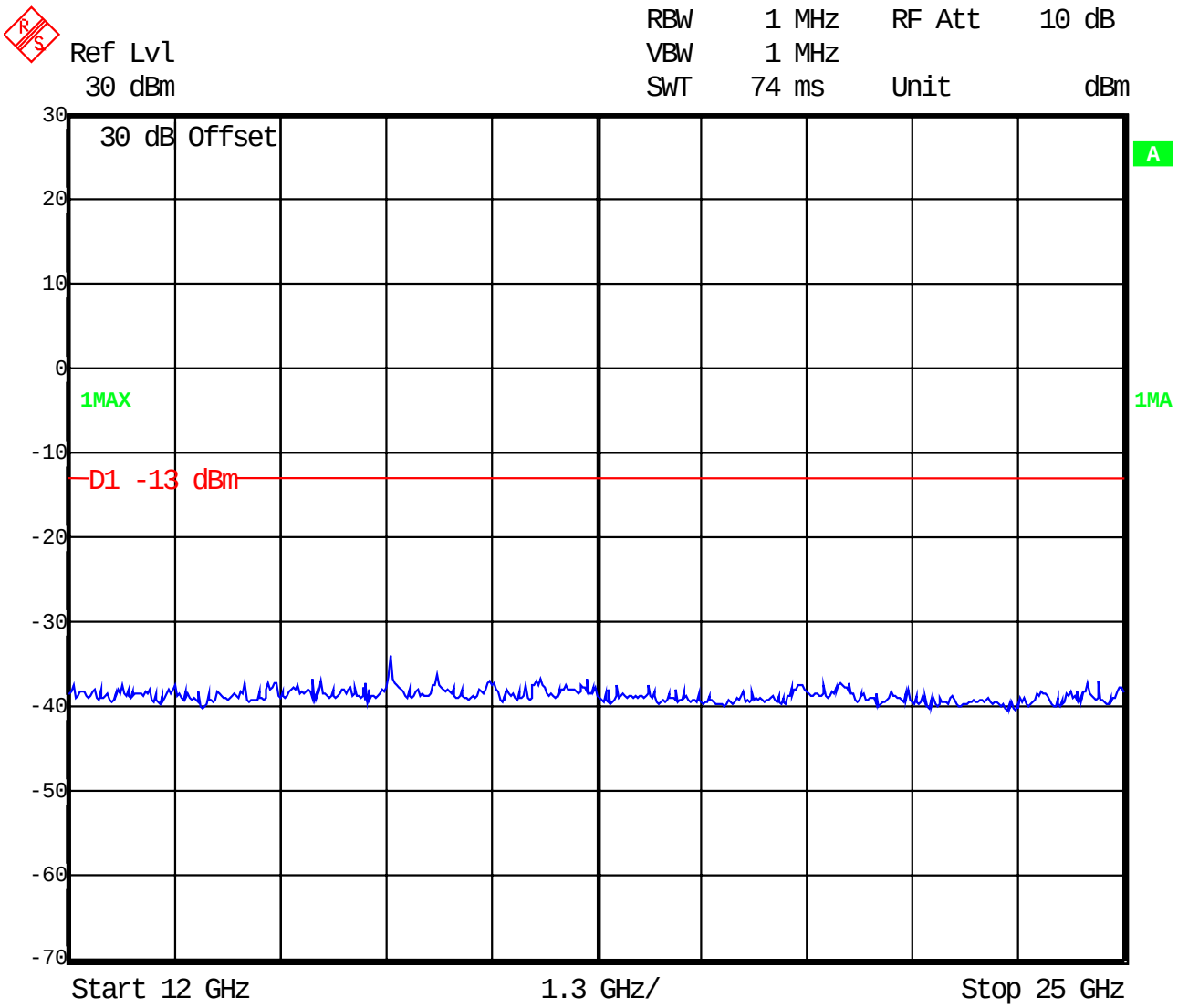
**Channel 810 : –25 GHz**




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
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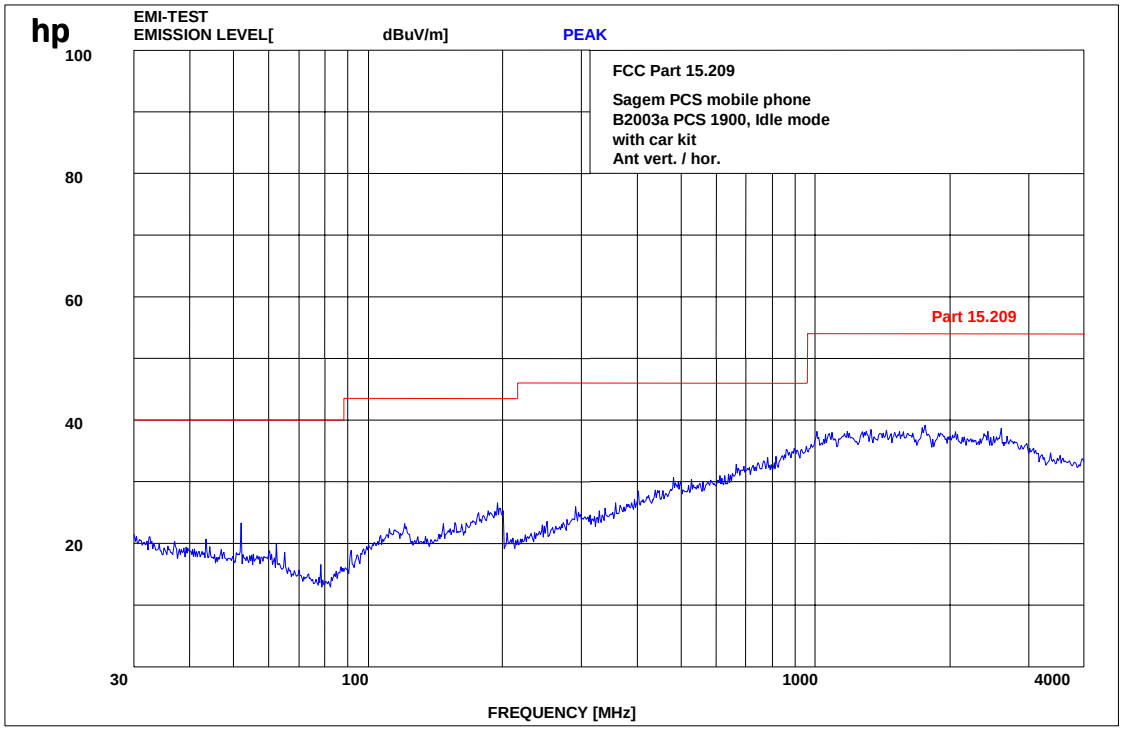
**Idle-Mode (this is valid for all 3 channels and up to 4 GHz)**

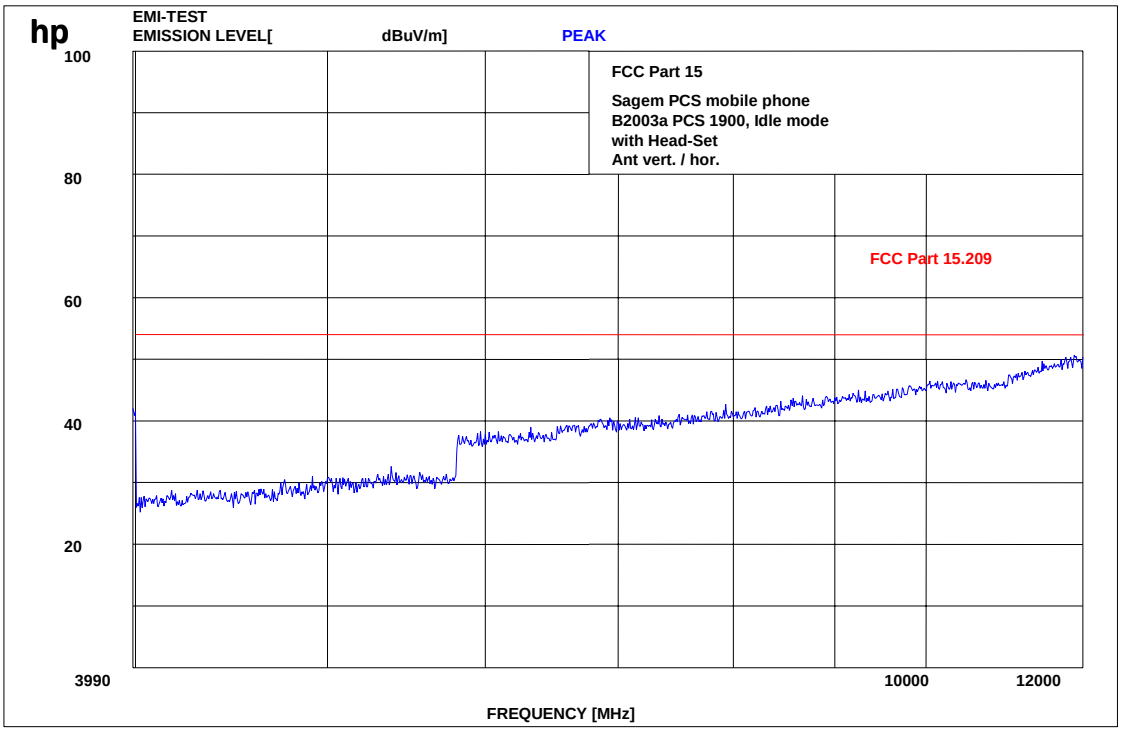
**no peak found**




**f < 1 GHz : RBW/VBW: 100 kHz** **f ≥ 1GHz : RBW/VBW 1 MHz**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## Idle-Mode (this is valid for all 3 channels and up to 12 GHz)




**f < 1 GHz : RBW/VBW: 100 kHz** **f ≥ 1GHz : RBW/VBW 1 MHz**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
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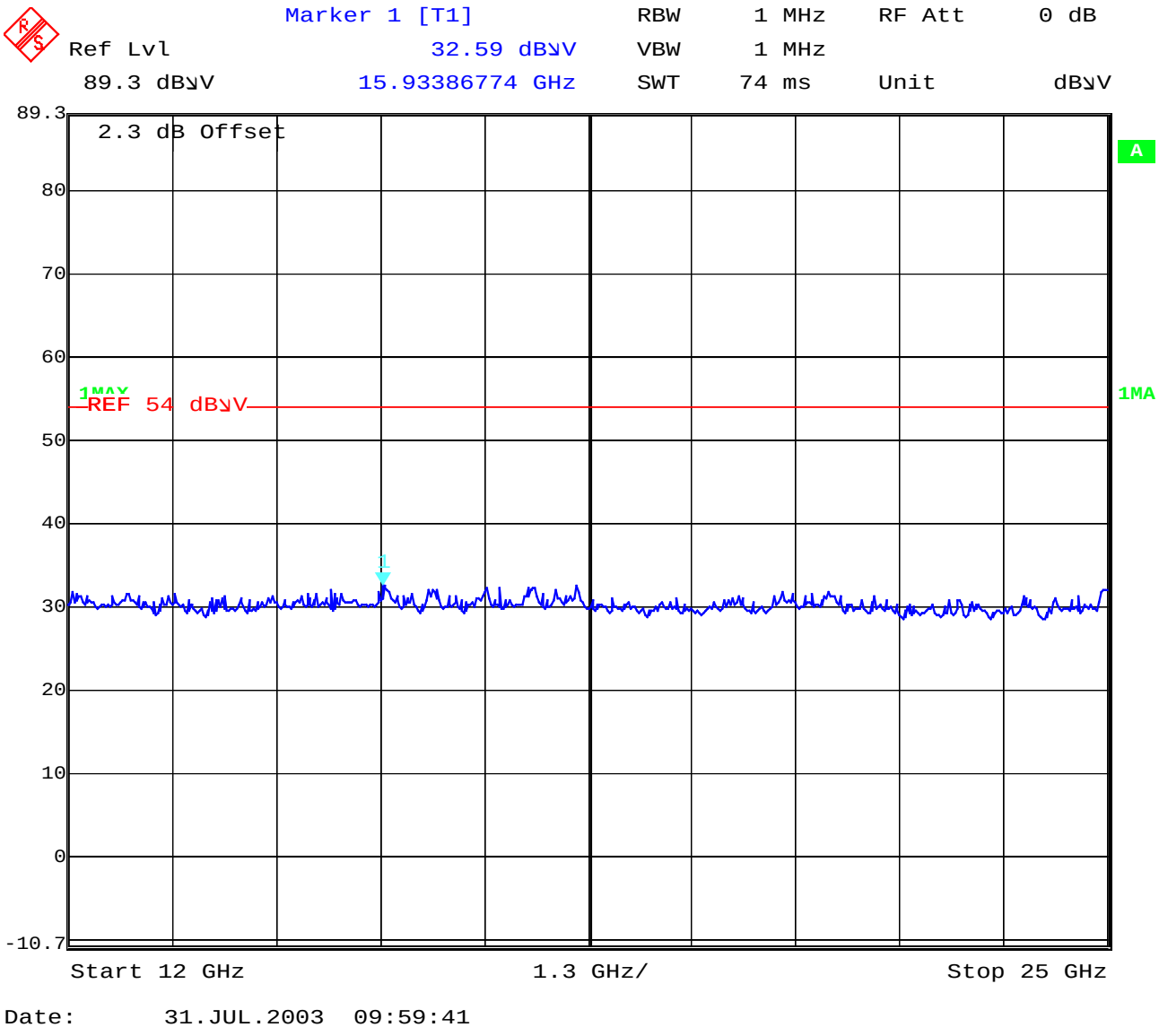
**Idle-Mode (this is valid for all 3 channels and up to 25 GHz)**




**For this measurement we used a special wideband horn antenna and a low noise preamp.**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## CONDUCTED SPURIOUS EMISSIONS

**Measurement Procedure:**

The following steps outline the procedure used to measure the conducted emissions from the mobile station.

1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency.

For the mobile station equipment tested, this equates to a frequency range of 13 MHz to 19.1 GHz, data taken from 10 MHz to 20 GHz.

2. Determine mobile station transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.

**USPCS Transmitter**

**Channel Frequency**

512 1850.2 MHz

661 1880.0 MHz

810 1909.8 MHz

**Measurement Limit:**

Sec. 24.238 Emission Limits.

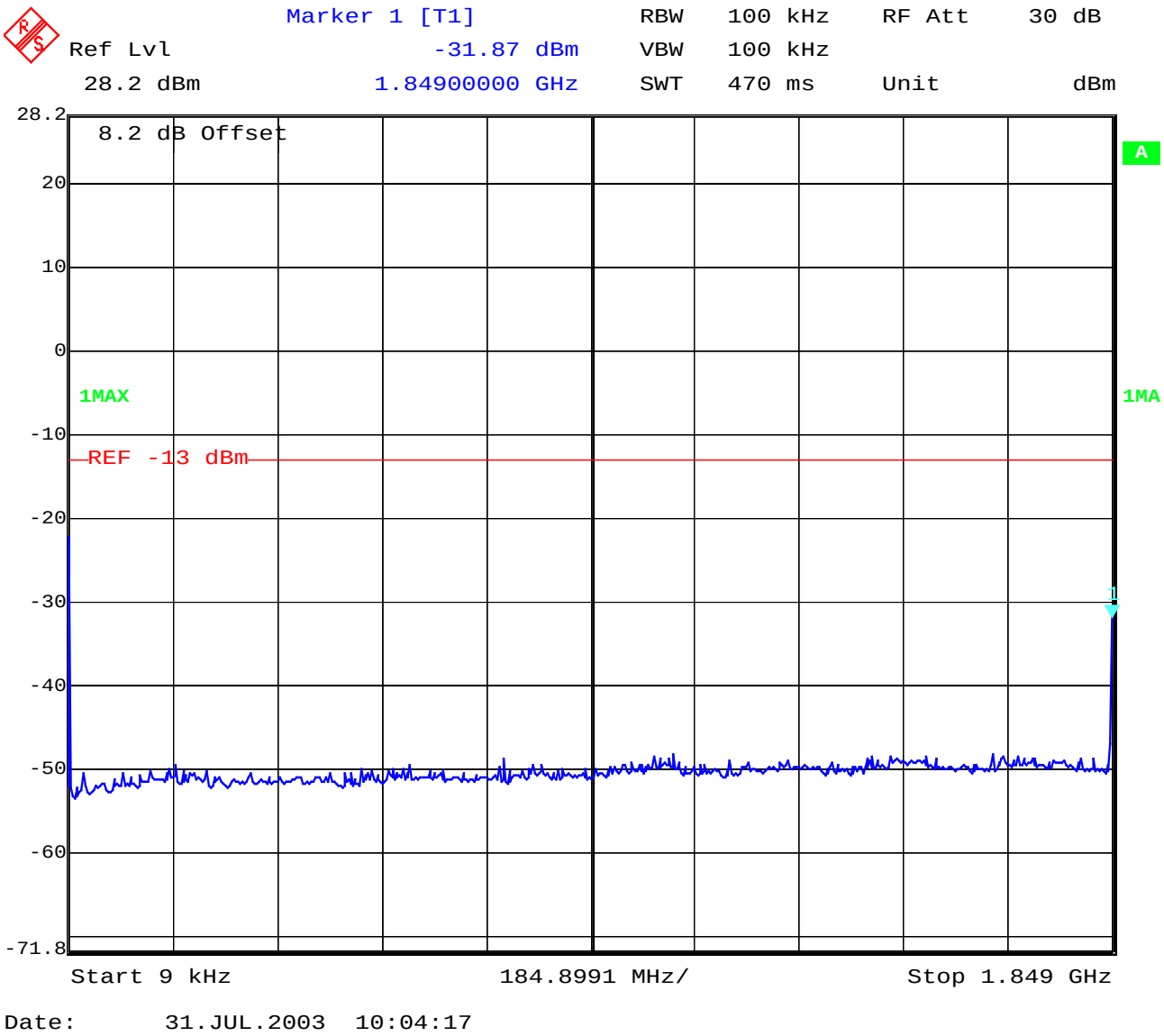
(a) On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

| EMISSION LIMITATIONS | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| **f (MHz)** | | **amplitude of emission (dBm)** | **limit max. allowed emission power (dBm)** | **actual attenuation below frequency of operation (dBc)** | **results** |
| **CH 512** | | | | | |
| **1850.2** | | **29.45** | **-13.0 (42.45 dBc)** | | **carrier** |
| **1849.00** | | **-31.87** | | **61.32** | **complies** |
| **1949.99** | | **-14.26** | | **43.71** | **complies** |
| **9233.0** | | **-32.17** | | **61.62** | **complies** |
| | | | | | |
| | | | | | |
| **CH 661** | | | | | |
| **1880.0** | | **29.25** | **-13.0 (42.25 dBc)** | | **carrier** |
| **1879.0** | | **-31.71** | | **60.96** | **complies** |
| | | | | | |
| | | | | | |
| | | | | | |
| **CH 810** | | | | | |
| | | | | | |
| **1909.8** | | **28.67** | **-13.0 (41.67 dBc)** | | **carrier** |
| **1908.80** | | **-29.24** | | **57.91** | **complies** |
| **1910.00** | | **-13.56** | | **42.23** | **complies** |
| **9545.0** | | **-35.14** | | **63.81** | **complies** |
| | | | | | |
| **Measurement uncertainty** | | **± 0.5dB** | | | |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

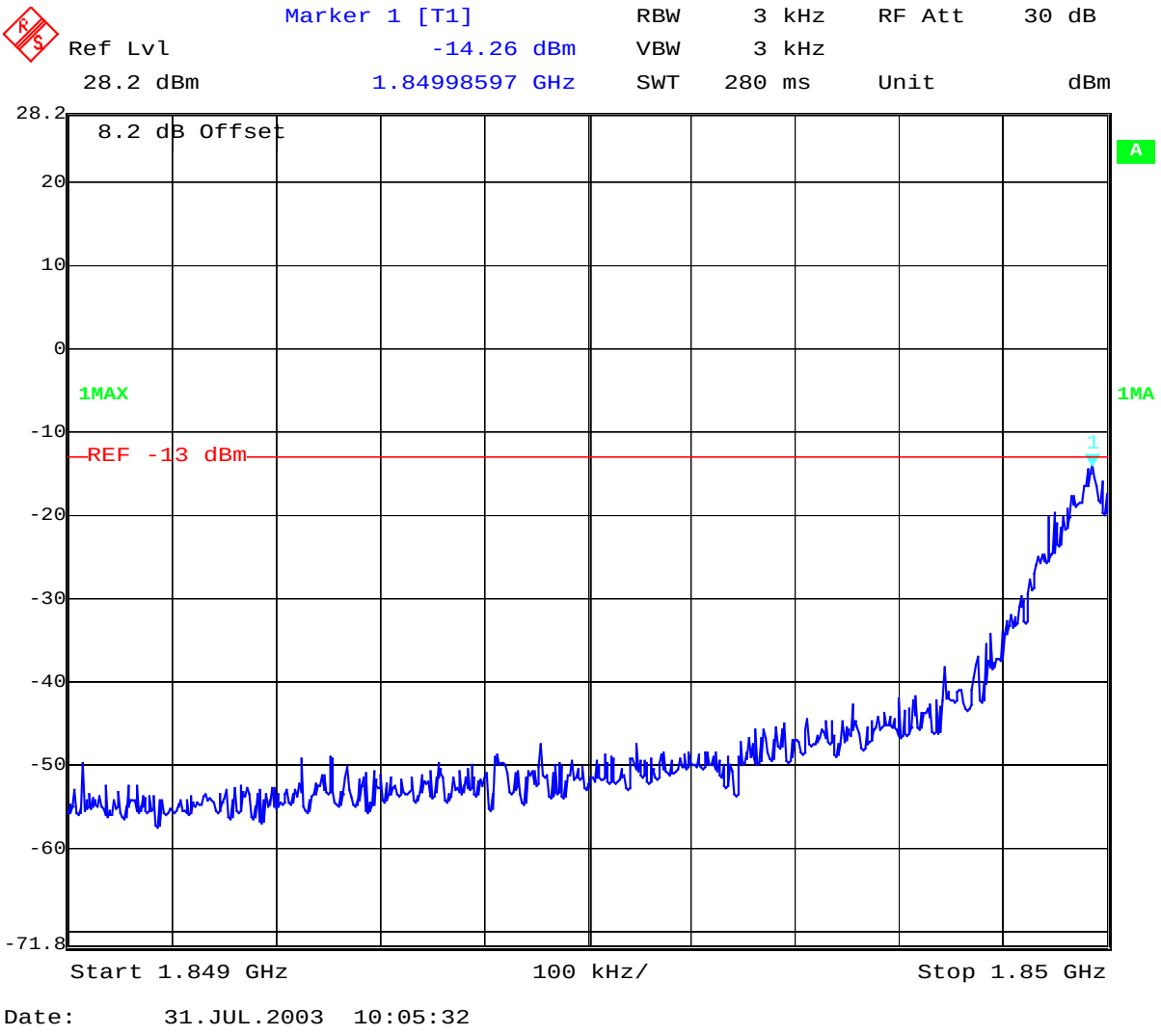
**Measurements:**

**Channel: 512**



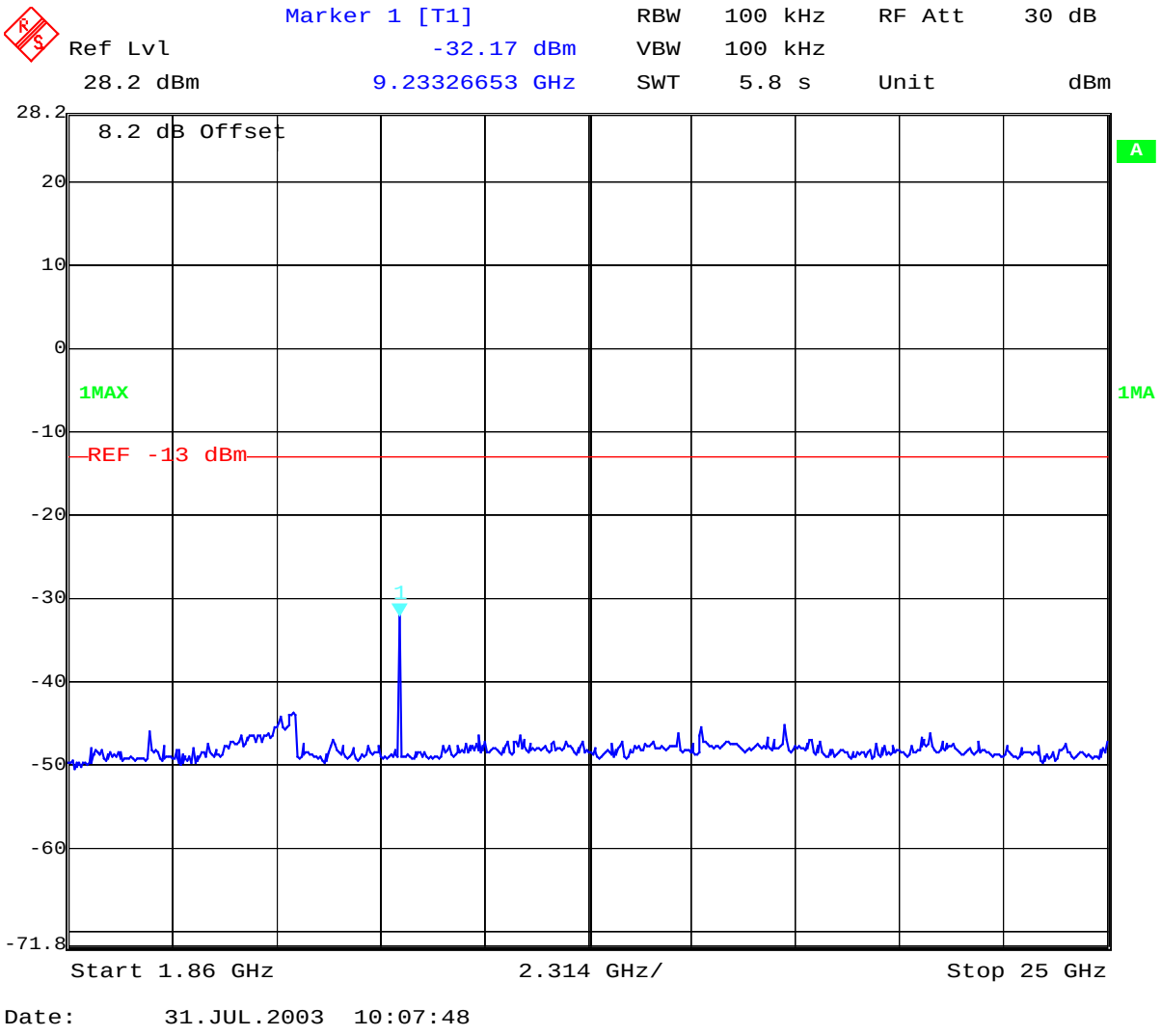

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

## Channel 512



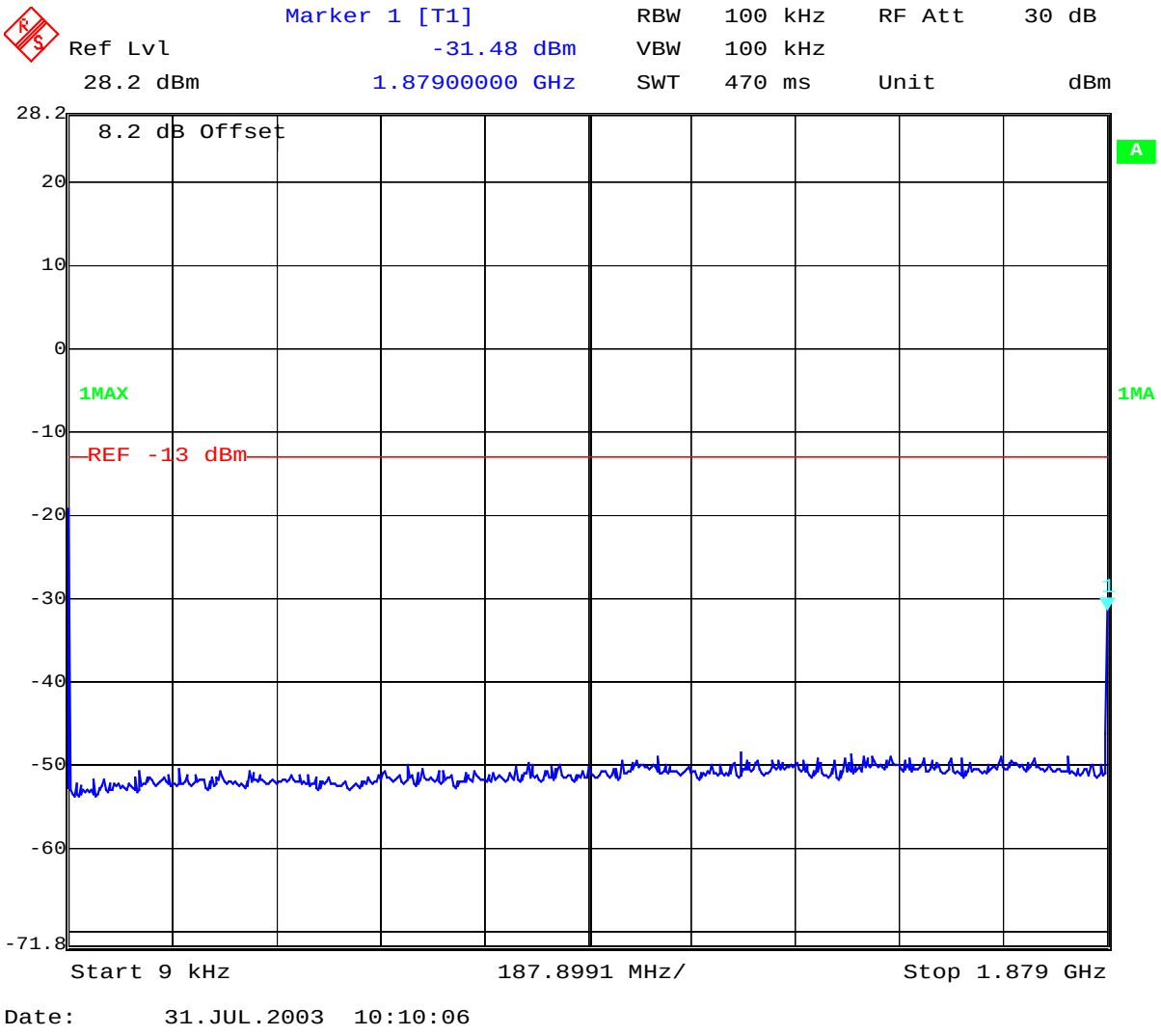

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

## Channel 512



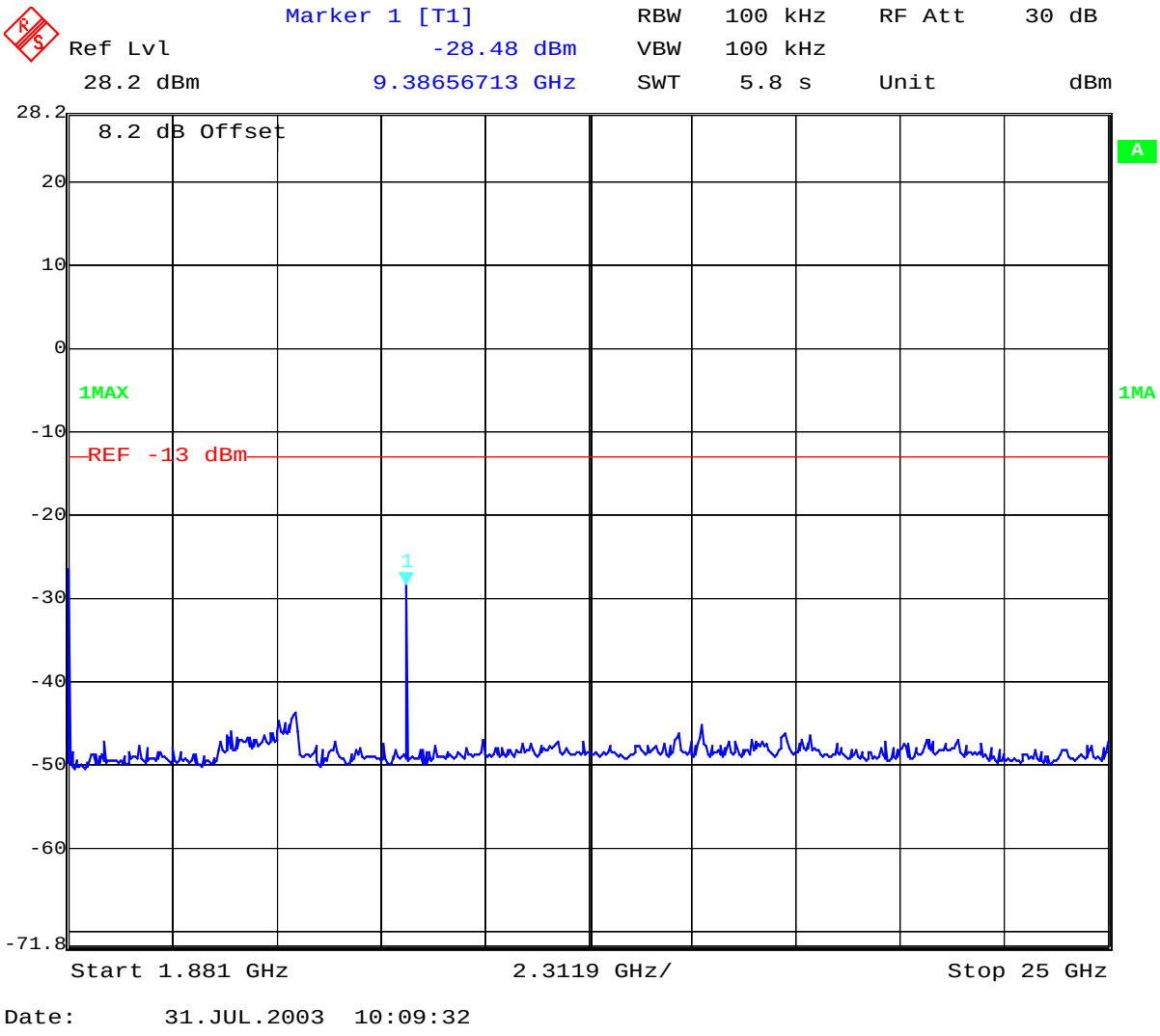

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

## Channel 661



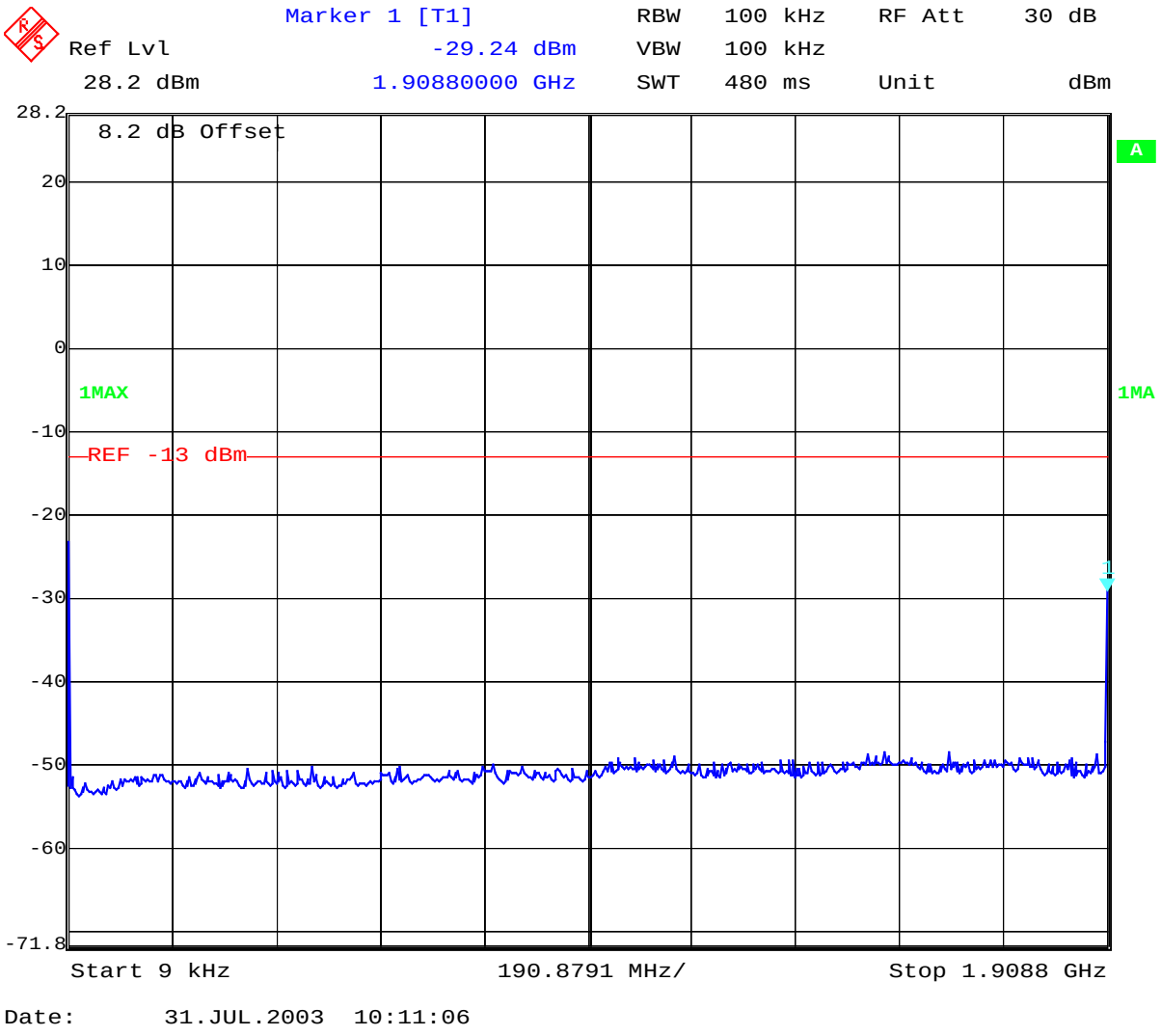

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

## Channel 661



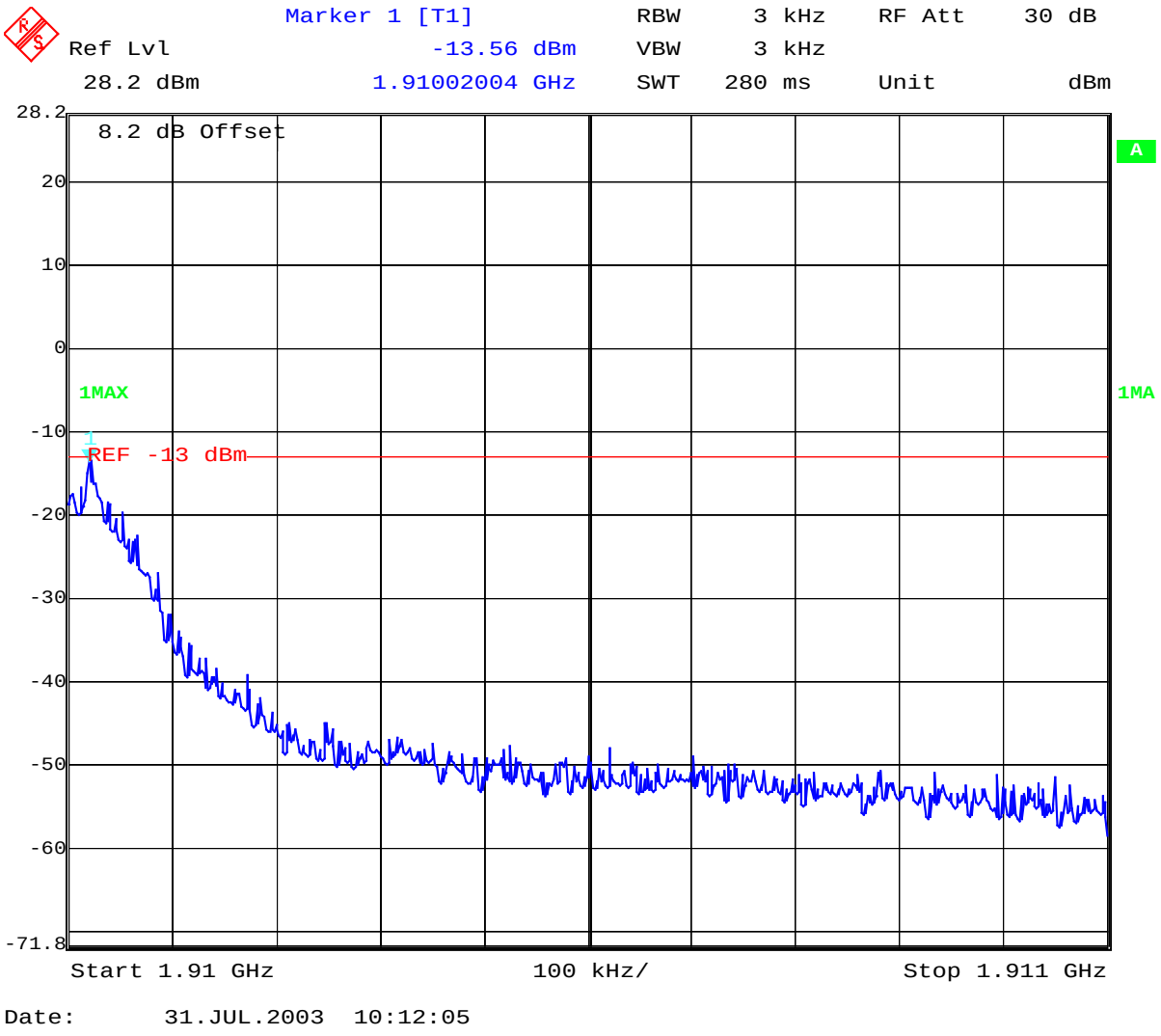

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

## Channel 810



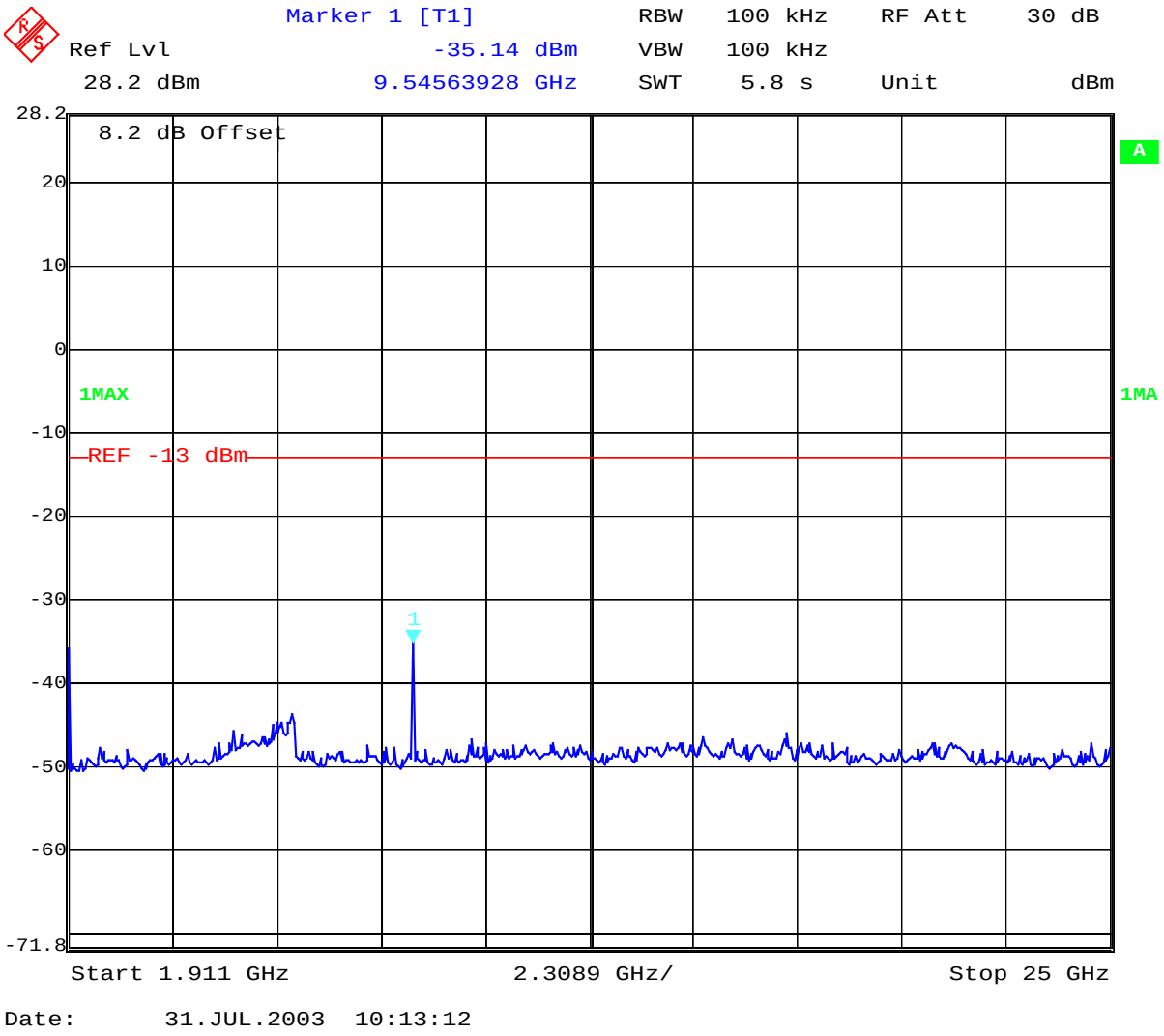

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

## Channel 810




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

## Channel 810

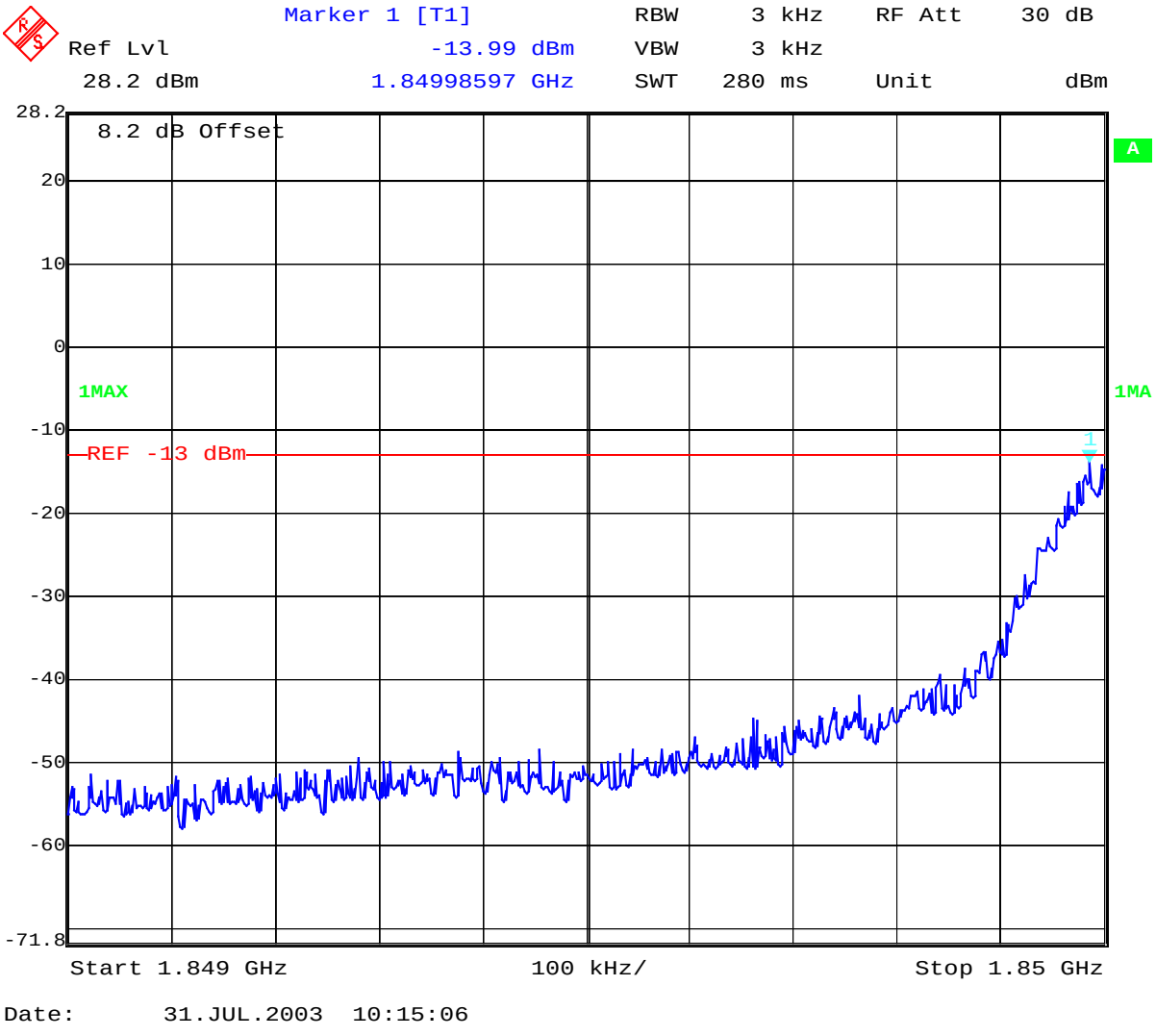



**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

## BLOCK EDGE COMPLIANCE FOR BLOCK A, B, C, D, E AND F

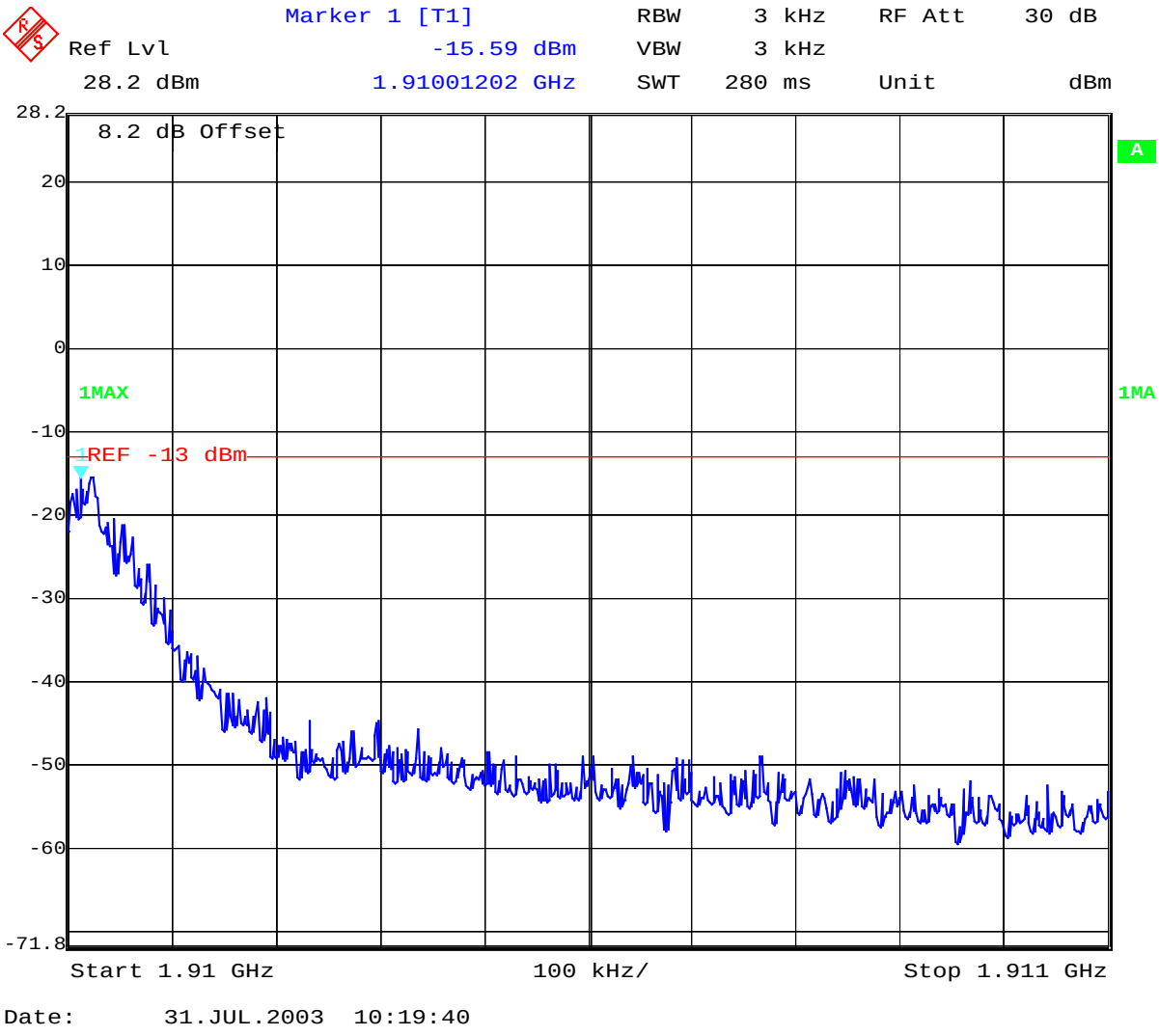
**Measurement Limit:**
Sec. 24.238 Emission Limits.
(a) On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

**Measurements:**
**Block A Channel 512**




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

## Block C Channel 810




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

## OCCUPIED BANDWIDTH §2.989

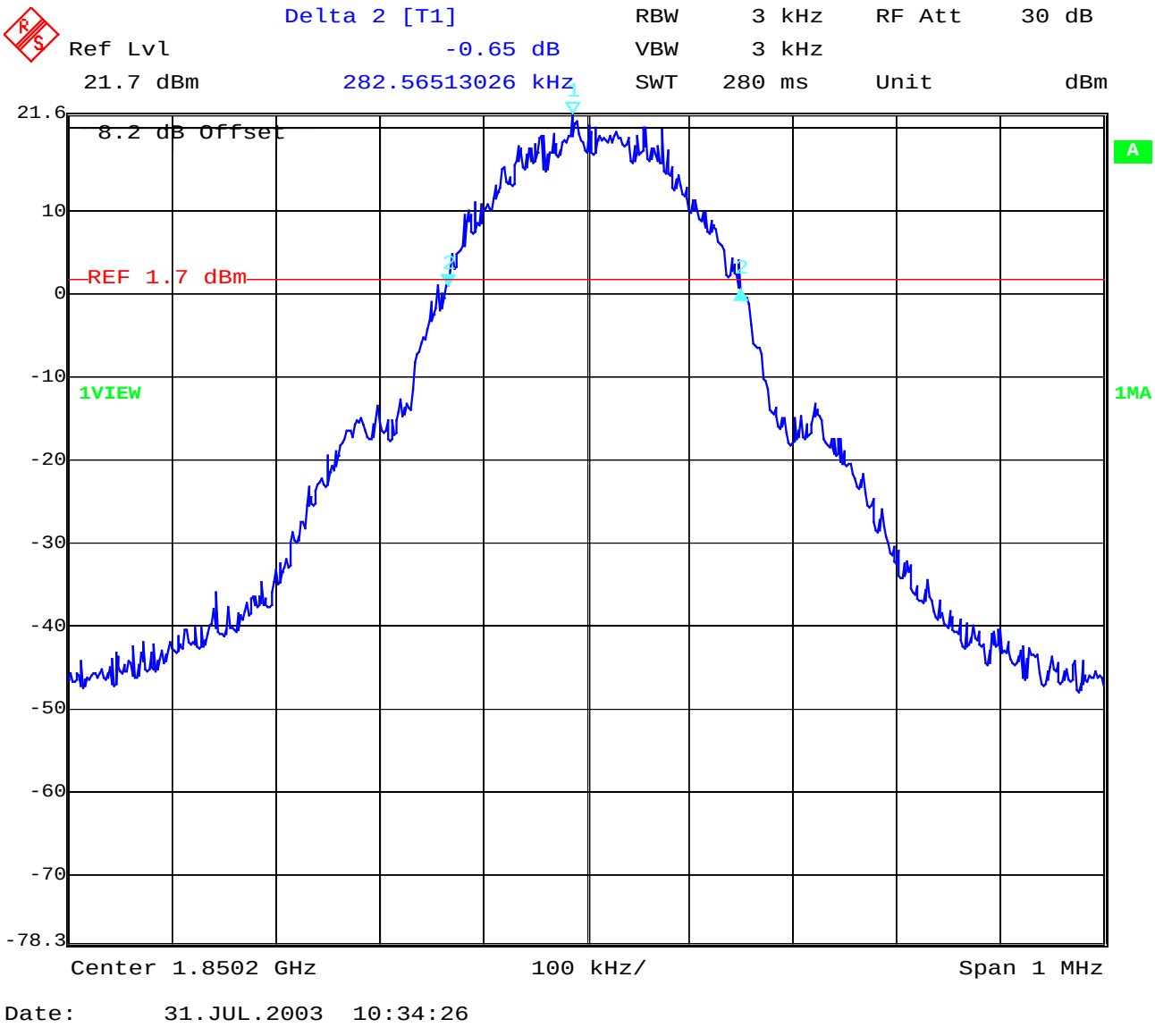
**Occupied Bandwidth Results**

Similar to conducted emissions, occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the USPCS frequency band. Table 8.2 below lists the measured 99% power and -26dBC occupied bandwidths. Spectrum analyzer plots are included on the following pages.

| Frequency | 99% Occupied Bandwidth | -26 dBc Bandwidth |
|---|---|---|
| 1850.2 MHz | 282.565 | 314.629 |
| 1880.0 MHz | 280.561 | 316.633 |
| 1909.8 MHz | 272.545 | 314.629 |

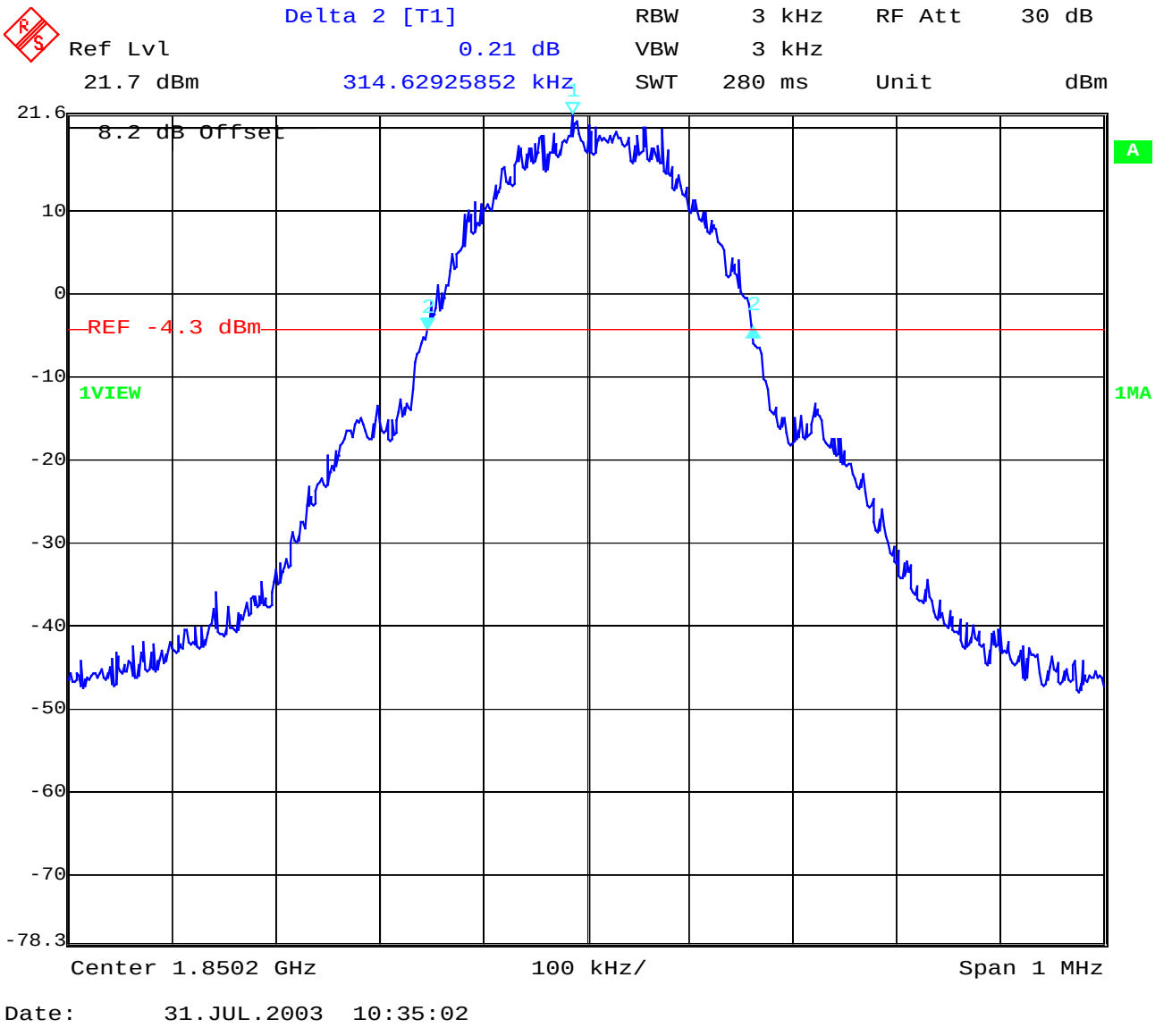
Part 24.238 (a) requires a measurement bandwidth of at least 1% of the occupied bandwidth. For ca. 281 kHz, this equates to a resolution bandwidth of at least 3.0 kHz. For this testing, a resolution bandwidth 3.0 kHz was used.

**Channel 512**
**99% Occupied Bandwidth**



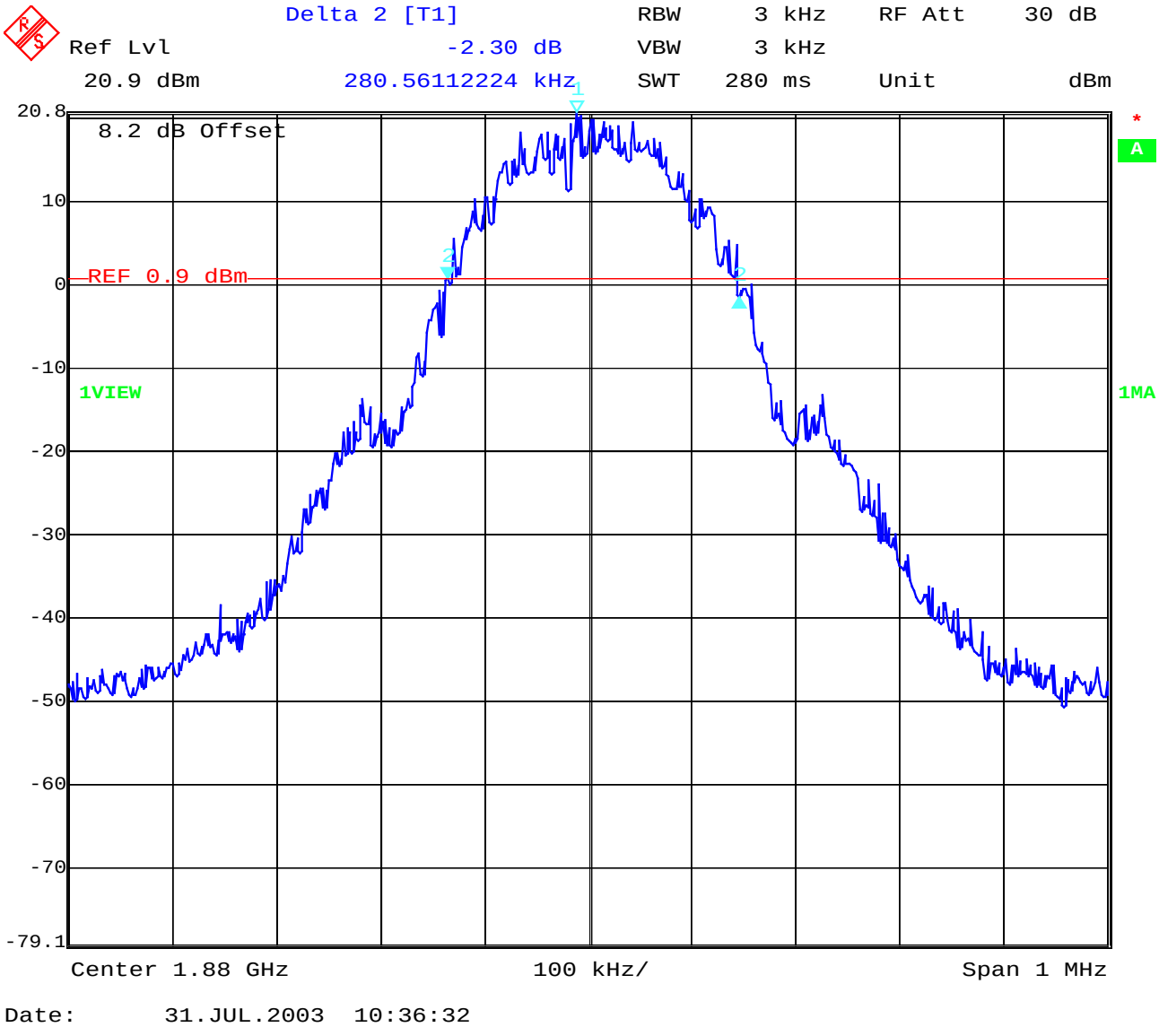

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

**Channel 512**
**-26 dBc Bandwidth**



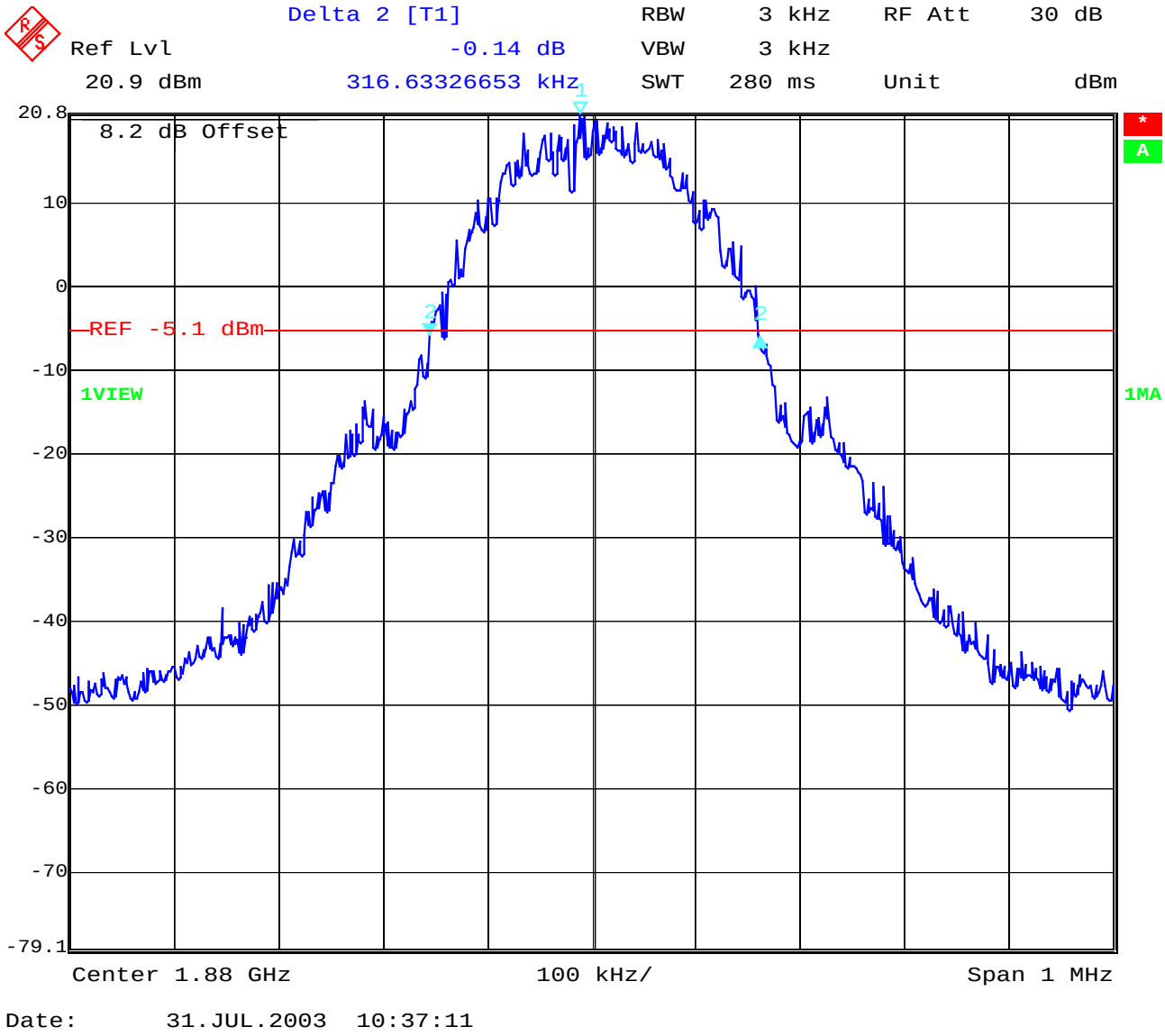

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

**Channel 661**
**99% Occupied Bandwidth**



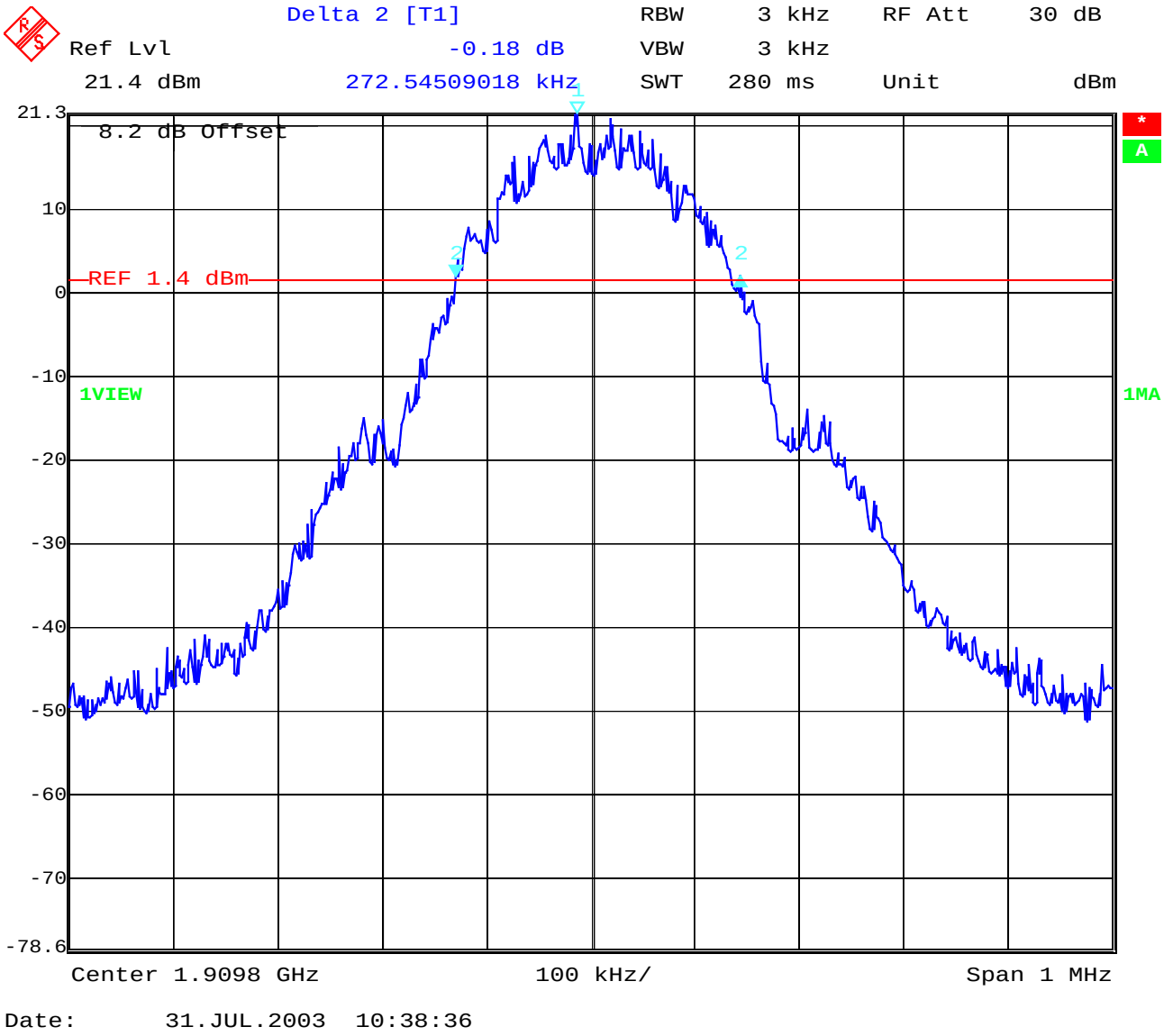

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

**Channel 661**
**-26 dBc Bandwidth**



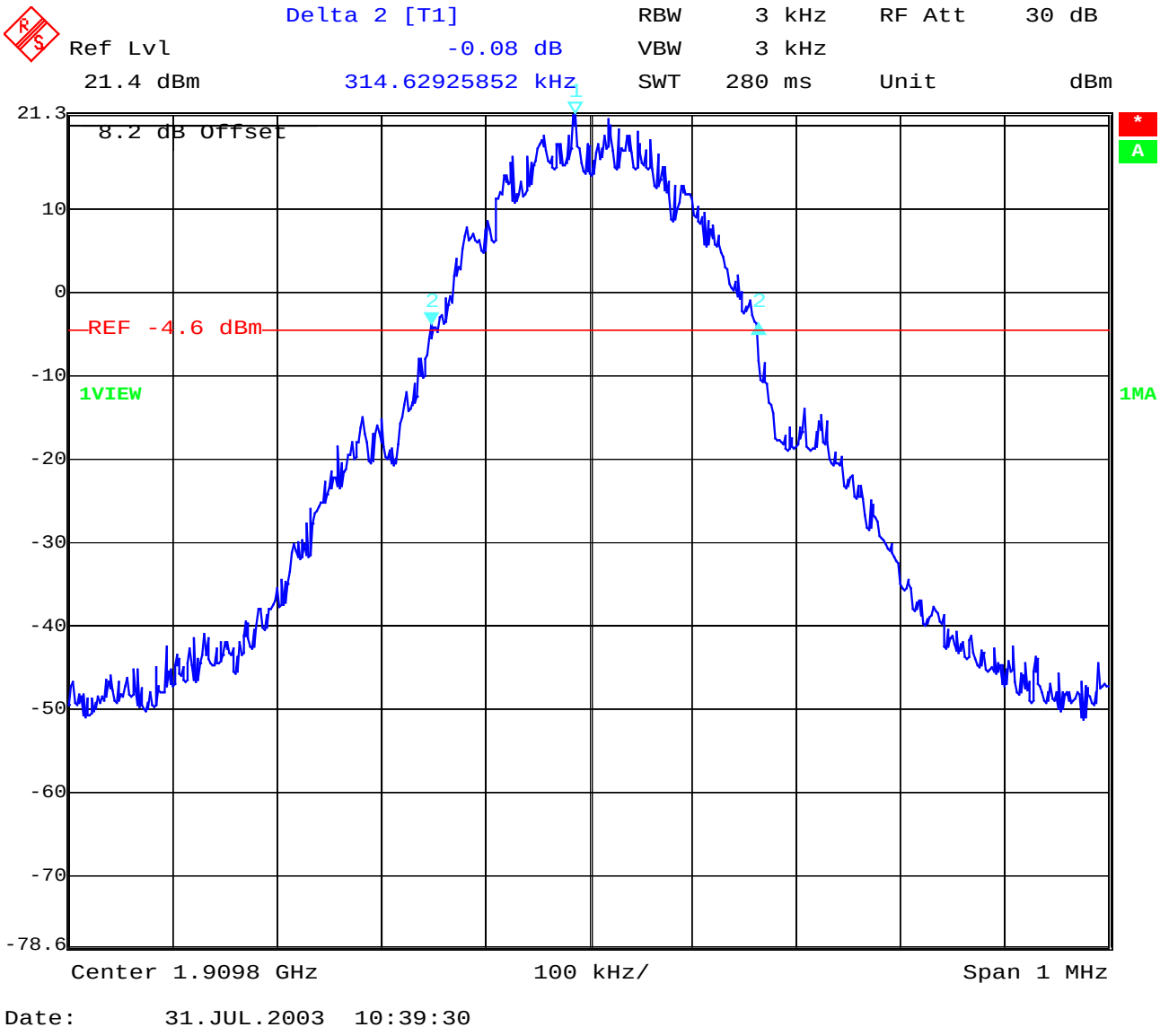

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

**Channel 810**
**99% Occupied Bandwidth**




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

**Channel 810**
**-26 dBc Bandwidth**



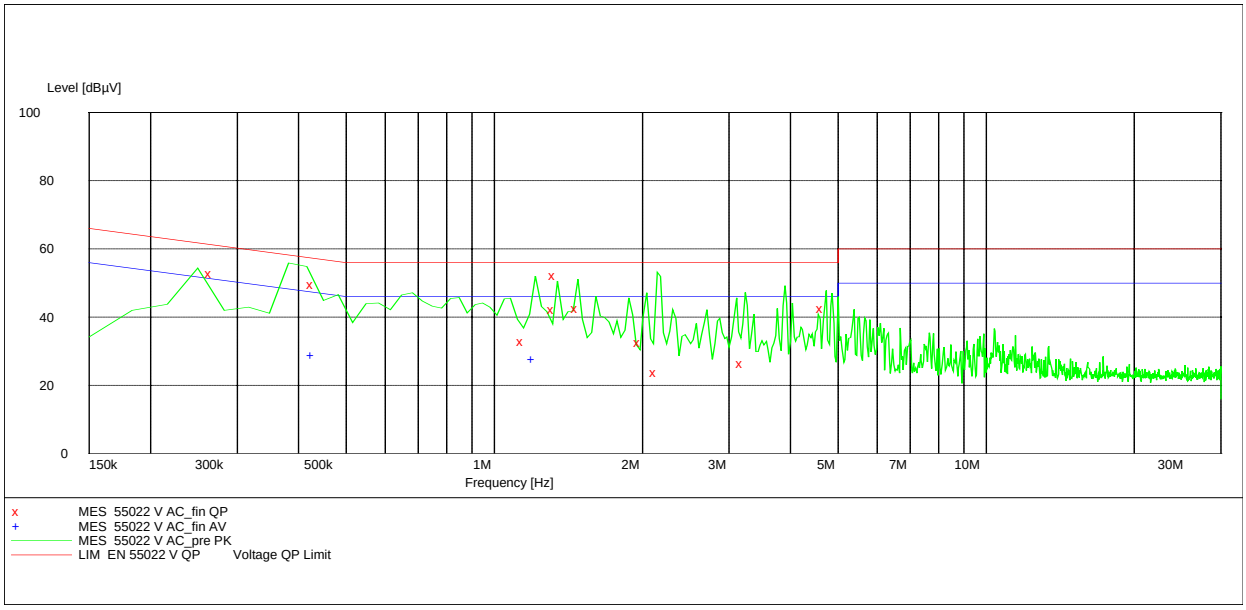

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

## CONDUCTED EMISSIONS § 15.107/207

**With charger TA3651-US, idle mode (Valid for PCS 850 and PCS1900)**

***CISPR 22***

EUT: Mobil-phone B2003a
Manufacturer: Sagem
Operating Condition: With charging unit TA3651-US, idle mode
Test Specification: CISPR 22
Comment: pass




***MEASUREMENT RESULT: "CISPR22 AC_fin QP"***

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---|---|---|---|---|---|---|
| 0.270000 | 52.80 | 10.8 | 61 | 8.3 | N | FLO |
| 0.435000 | 49.50 | 10.5 | 57 | 7.7 | L1 | FLO |
| 1.162500 | 32.80 | 10.3 | 56 | 23.2 | L1 | GND |
| 1.342500 | 42.30 | 10.3 | 56 | 13.7 | N | FLO |
| 1.350000 | 52.30 | 10.3 | 56 | 3.7 | N | FLO |
| 1.500000 | 42.40 | 10.3 | 56 | 13.6 | L1 | GND |
| 2.010000 | 32.60 | 10.4 | 56 | 23.4 | L1 | GND |
| 2.167500 | 23.60 | 10.4 | 56 | 32.4 | L1 | GND |
| 3.240000 | 26.30 | 10.5 | 56 | 29.7 | L1 | GND |
| 4.725000 | 42.50 | 10.5 | 56 | 13.5 | L1 | GND |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

***MEASUREMENT RESULT: "CISPR22 AC_fin AV"***

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---|---|---|---|---|---|---|
| 0.435000 | 28.70 | 10.5 | 47 | 18.5 | L1 | FLO |
| 1.222500 | 27.60 | 10.3 | 46 | 18.4 | L1 | GND |

**Limit § 15.207**

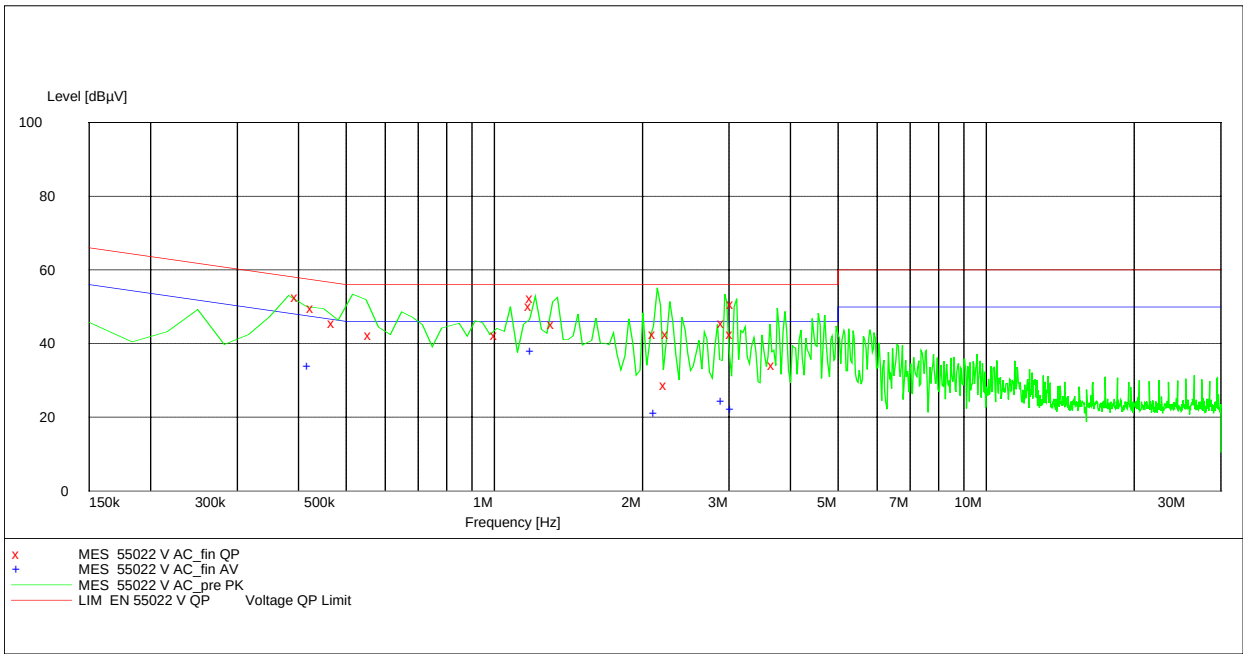
| Frequency of Emission (MHz) | Conducted Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 * | 56 to 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

* **Decreases with the logarithm of the frequency.**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

**With charger TA3651-US, traffic mode (Valid for PCS 850 and PCS1900)**

EUT: Mobile phone B2003A
Manufacturer: Sagem
Operating Condition: With charging unit TA3651-US, traffic mode mode
Test Specification: CISPR 22
Comment: pass




***MEASUREMENT RESULT: "CISPR22 AC_fin QP"***

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---|---|---|---|---|---|---|
| 0.405000 | 52.70 | 10.6 | 58 | 5.1 | L1 | FLO |
| 0.435000 | 49.50 | 10.5 | 57 | 7.7 | L1 | FLO |
| 0.480000 | 45.50 | 10.3 | 56 | 10.8 | L1 | FLO |
| 0.570000 | 42.30 | 10.4 | 56 | 13.7 | L1 | FLO |
| 1.027500 | 42.20 | 10.3 | 56 | 13.8 | L1 | FLO |
| 1.207500 | 50.10 | 10.3 | 56 | 5.9 | L1 | FLO |
| 1.215000 | 52.30 | 10.3 | 56 | 3.7 | L1 | FLO |
| 1.342500 | 45.30 | 10.3 | 56 | 10.7 | L1 | FLO |
| 2.152500 | 42.50 | 10.4 | 56 | 13.5 | L1 | FLO |
| 2.272500 | 28.80 | 10.4 | 56 | 27.2 | L1 | FLO |
| 2.287500 | 42.40 | 10.4 | 56 | 13.6 | L1 | FLO |
| 2.970000 | 45.50 | 10.4 | 56 | 10.5 | N | FLO |
| 3.097500 | 42.40 | 10.4 | 56 | 13.6 | N | GND |
| 3.105000 | 50.80 | 10.4 | 56 | 5.2 | N | GND |
| 3.765000 | 34.20 | 10.5 | 56 | 21.8 | N | GND |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

***MEASUREMENT RESULT: "CISPR22 AC_fin AV"***

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---|---|---|---|---|---|---|
| 0.427500 | 33.80 | 10.5 | 47 | 13.5 | L1 | FLO |
| 1.215000 | 38.00 | 10.3 | 46 | 8.0 | L1 | FLO |
| 2.160000 | 21.00 | 10.4 | 46 | 25.0 | L1 | FLO |
| 2.962500 | 24.30 | 10.4 | 46 | 21.7 | N | FLO |
| 3.097500 | 22.10 | 10.4 | 46 | 23.9 | N | GND |

**Limit § 15.207**

| Frequency of Emission (MHz) | Conducted Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 * | 56 to 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

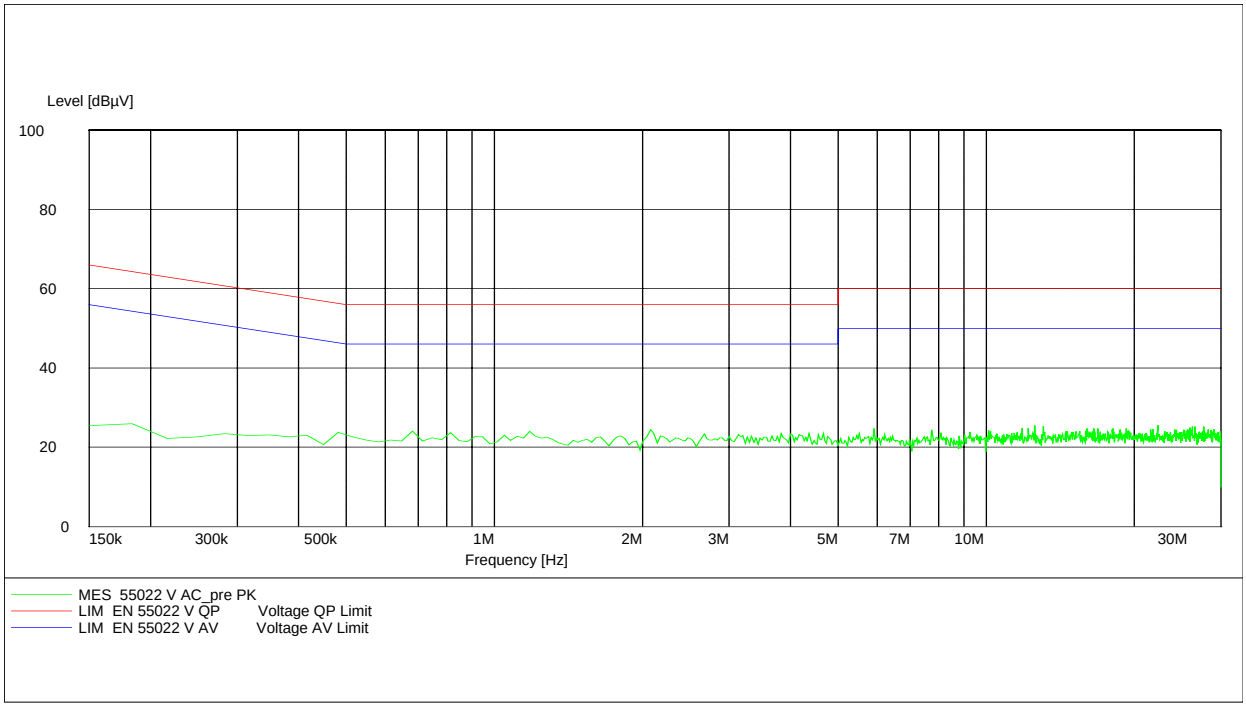
* **Decreases with the logarithm of the frequency.**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

**With charger 18805593-9, idle mode (Valid for PCS 850 and PCS1900)**

***CISPR 22***

EUT: B2003a
Manufacturer: Sagem
Operating Condition: With charging unit 18805593-9, idle mode
Test Specification: CISPR22
Comment: pass




**Limit § 15.207**

| Frequency of Emission (MHz) | Conducted Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 * | 56 to 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

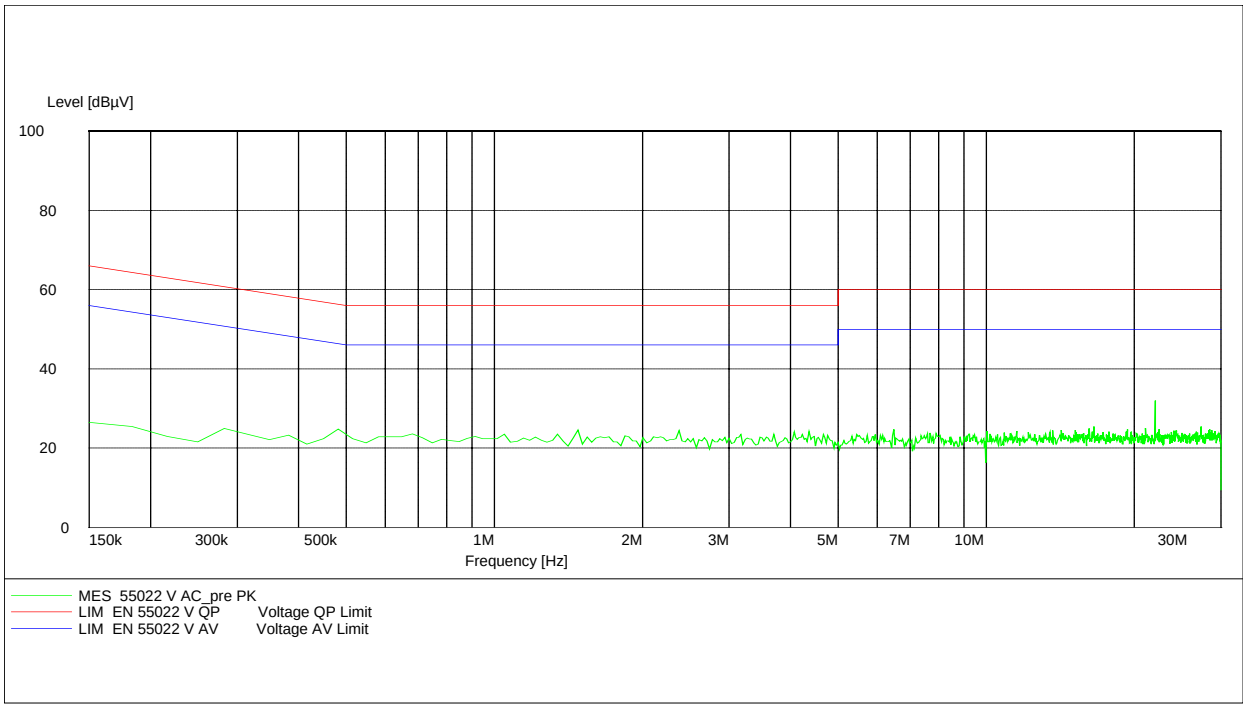
* **Decreases with the logarithm of the frequency.**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

**With charger 18805593-9, traffic mode (Valid for PCS 850 and PCS1900)**

***CISPR 22***

EUT: B2003a
Manufacturer: Sagem
Operating Condition: With charging unit 18805593-9, traffic mode
Test Specification: CISPR22
Comment: pass




**Limit § 15.207**

| Frequency of Emission (MHz) | Conducted Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 * | 56 to 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

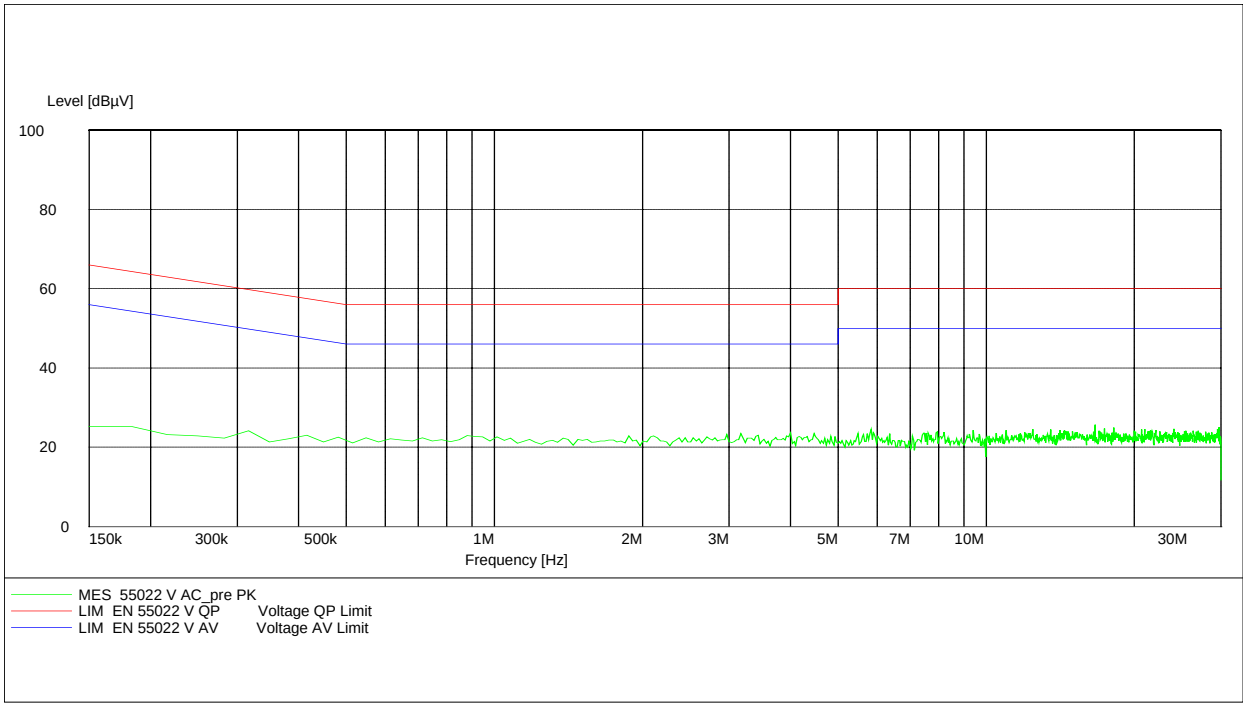
* **Decreases with the logarithm of the frequency.**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

**With charger DTC3515 045E040E, idle mode (Valid for PCS 850 and PCS1900)**

***CISPR 22***

EUT: B2003a
Manufacturer: Sagem
Operating Condition: With charging unit DTC3515-045E040E, idle mode
Test Specification: CISPR22
Comment: pass




**Limit § 15.207**

| Frequency of Emission (MHz) | Conducted Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 * | 56 to 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

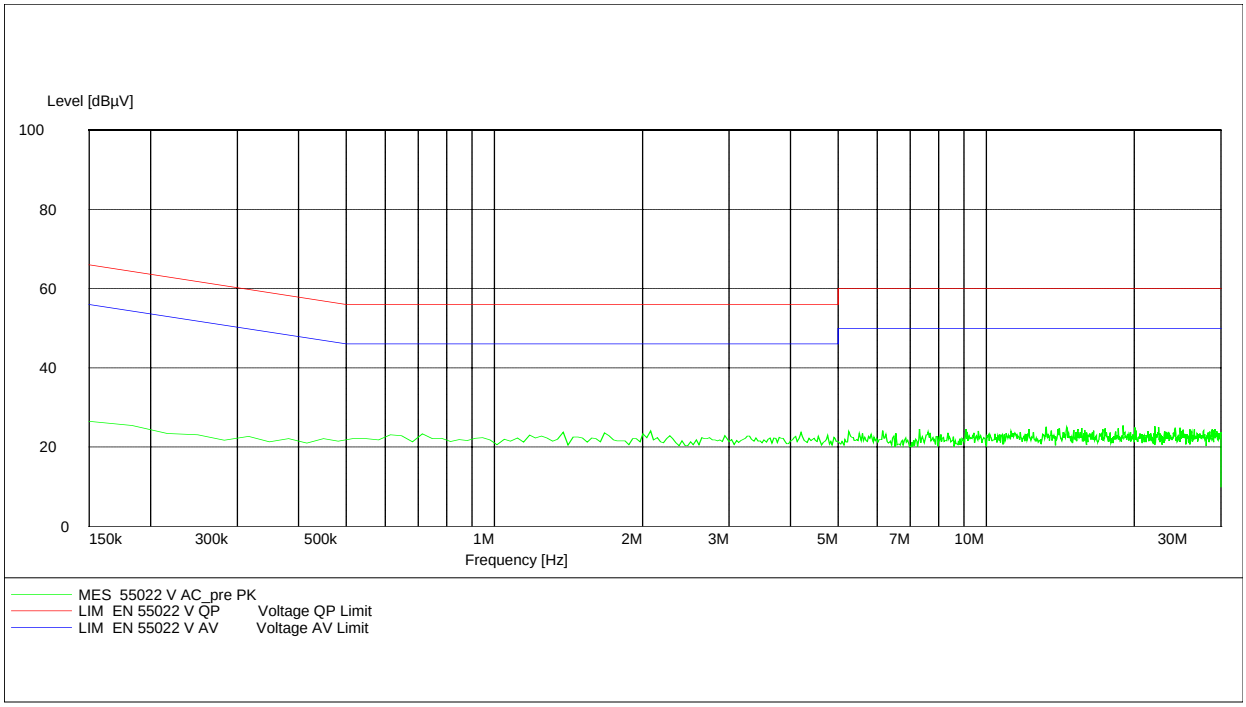
* **Decreases with the logarithm of the frequency.**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

**With charger DTC3515 045E040E, idle mode (Valid for PCS 850 and PCS1900)**

***CISPR 22***

EUT: B2003a
Manufacturer: Sagem
Operating Condition: With charging unit DTC3515-045E040E, traffic mode
Test Specification: CISPR22
Comment: pass




**Limit § 15.207**

| Frequency of Emission (MHz) | Conducted Limit (dBuV) | |
|---|---|---|
| | Quasi-peak | Average |
| 0.15-0.5 | 66 to 56 * | 56 to 46 * |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

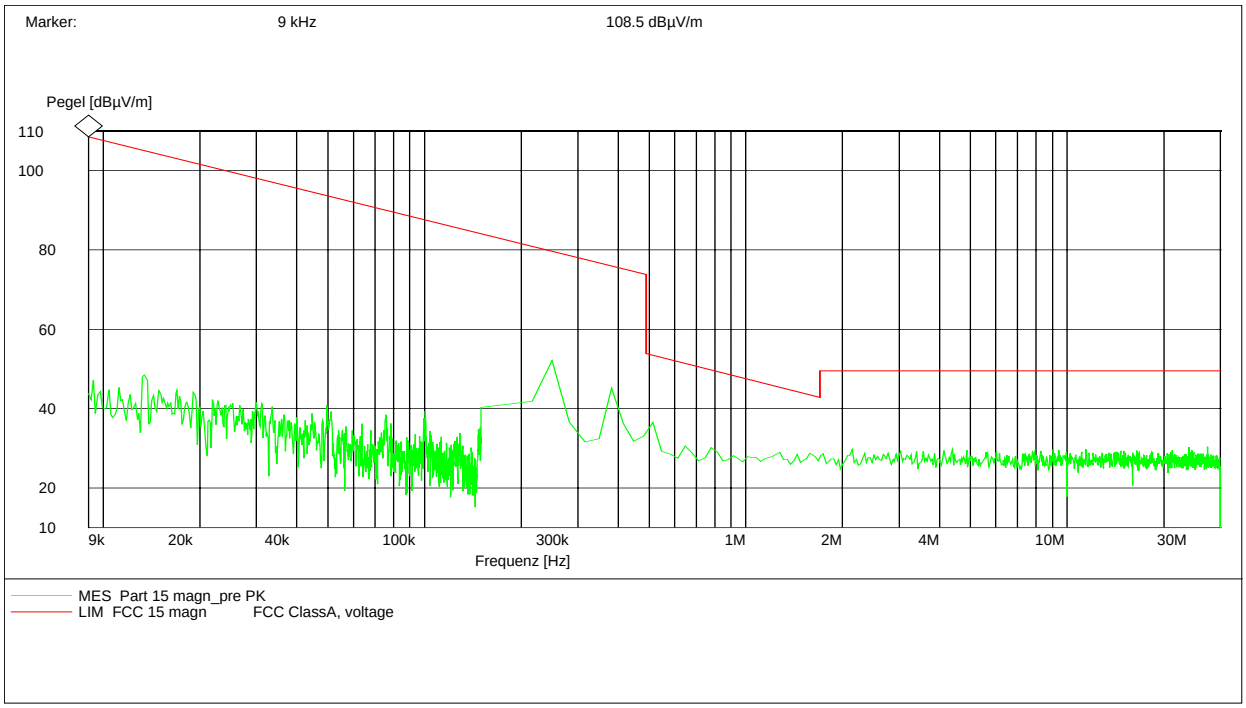
* **Decreases with the logarithm of the frequency.**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

## FCC Rule 47

## Part 15 Magnetics (Valid for PCS 850 and PCS1900)

EUT: Mobile phone 2003a
Manufacturer: Sagem
Operating Condition: Charger TA3651-US
Test Specification: 110V / 60 Hz, traffic and idle mode
Comment: pass

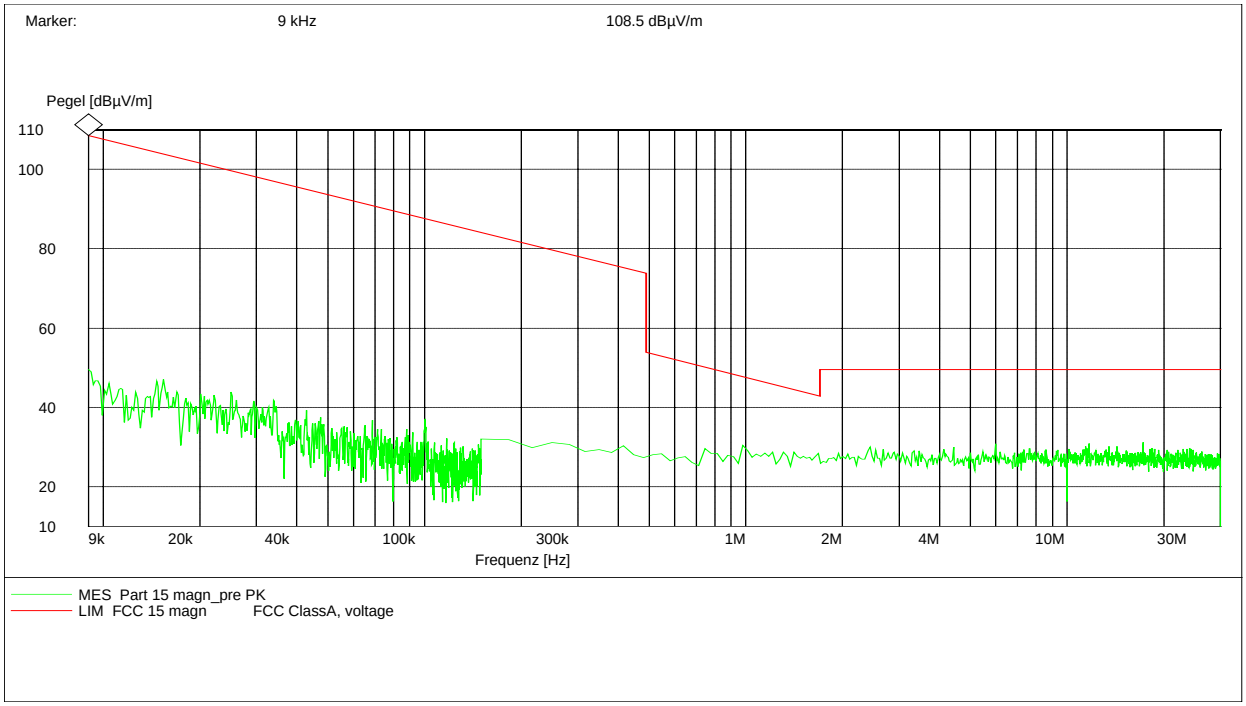



**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

## FCC Rule 47

## Part 15 Magnetics (Valid for PCS 850 and PCS1900)

| | |
|---|---|
| EUT: | Mobile phone 2003a |
| Manufacturer: | Sagem |
| Operating Condition: | Charger 18805593-9 |
| Test Specification: | traffic and idle mode |
| Comment: | pass |

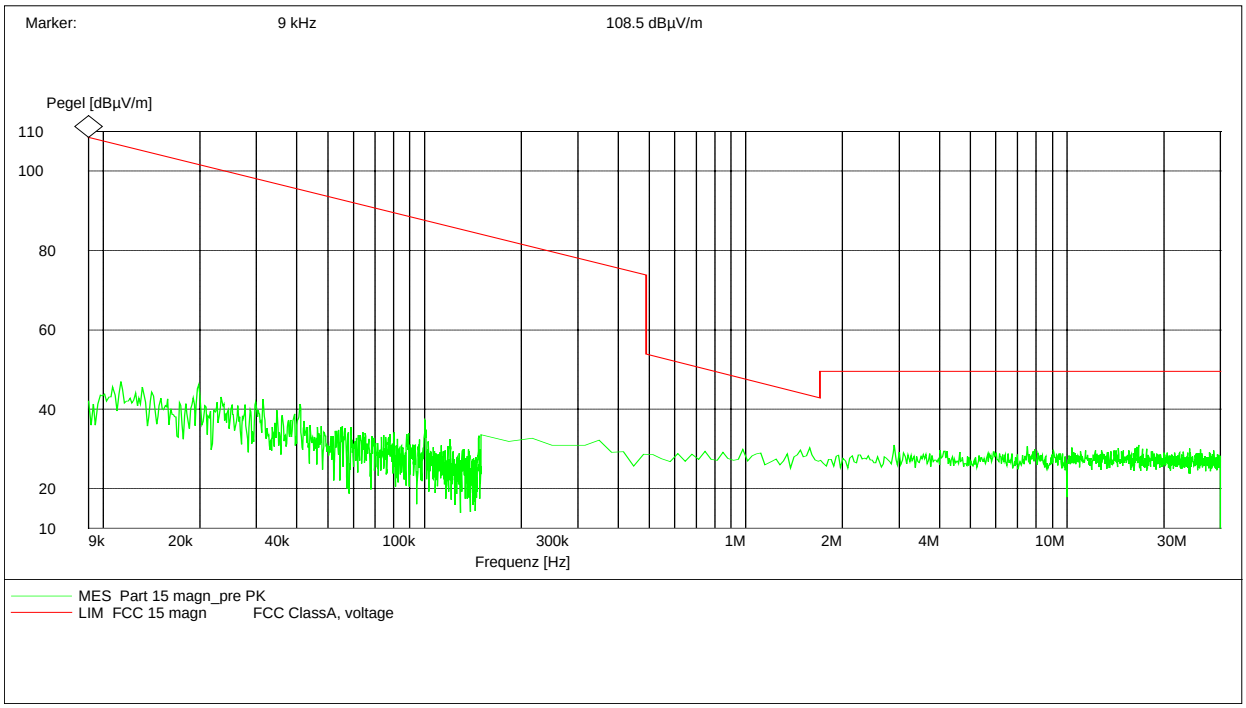



**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

## FCC Rule 47

## Part 15 Magnetics (Valid for PCS 850 and PCS1900)

| | |
|---|---|
| EUT: | Mobile phone 2003a |
| Manufacturer: | Sagem |
| Operating Condition: | Charger DTC3515 045E040E |
| Test Specification: | traffic and idle mode |
| Comment: | pass |

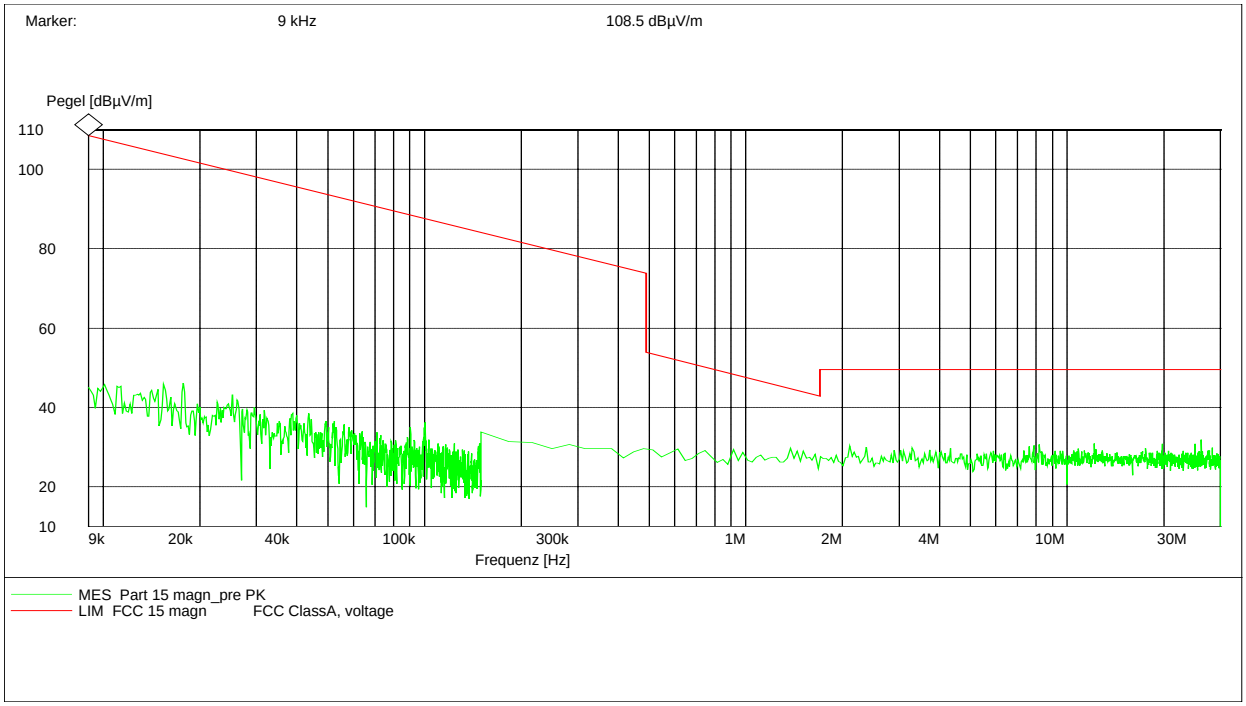



**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

## FCC Rule 47

## Part 15 Magnetics (Valid for PCS 850 and PCS1900)

| | |
|---|---|
| EUT: | Mobile phone 2003a |
| Manufacturer: | Sagem |
| Operating Condition: | with car kit A17-BA10-10 |
| Test Specification: | traffic and idle mode |
| Comment: | pass |

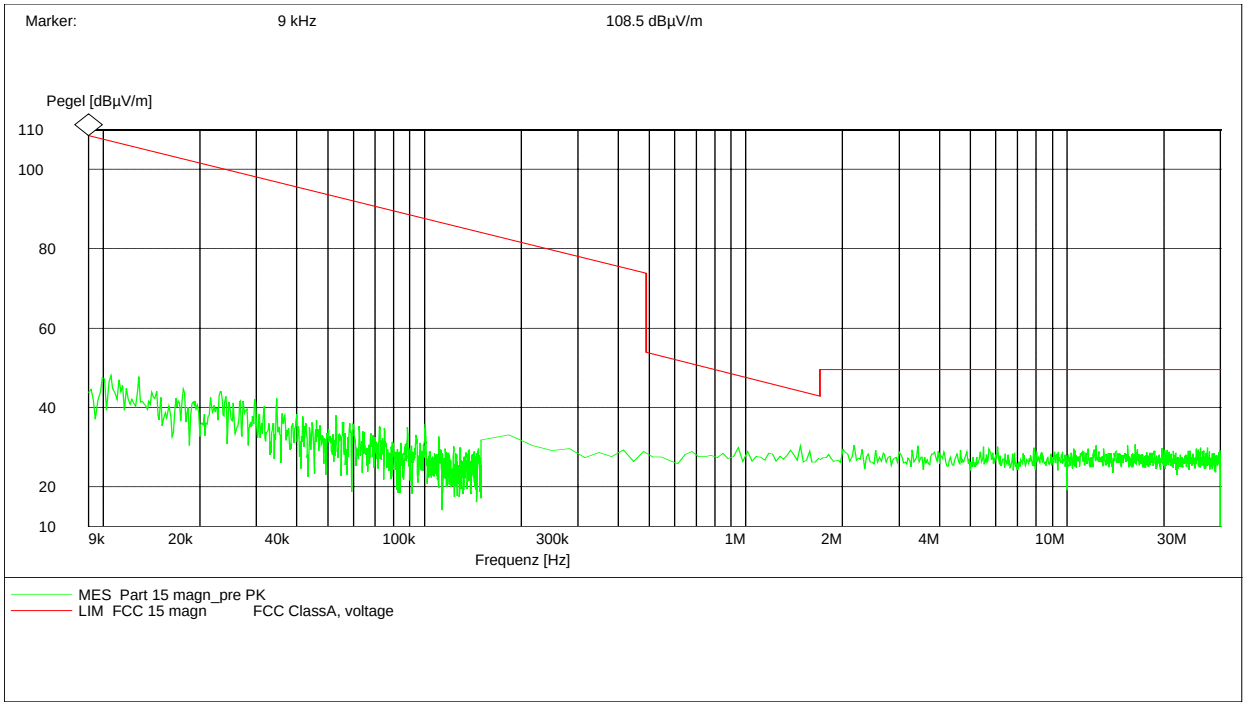



**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

## FCC Rule 47

## Part 15 Magnetics (Valid for PCS 850 and PCS1900)

EUT: Mobile phone 2003a
Manufacturer: Sagem
Operating Condition: with cigar lighter adapter 23811253-7 and data cable 23810787-0
Test Specification: traffic and idle mode
Comment: pass

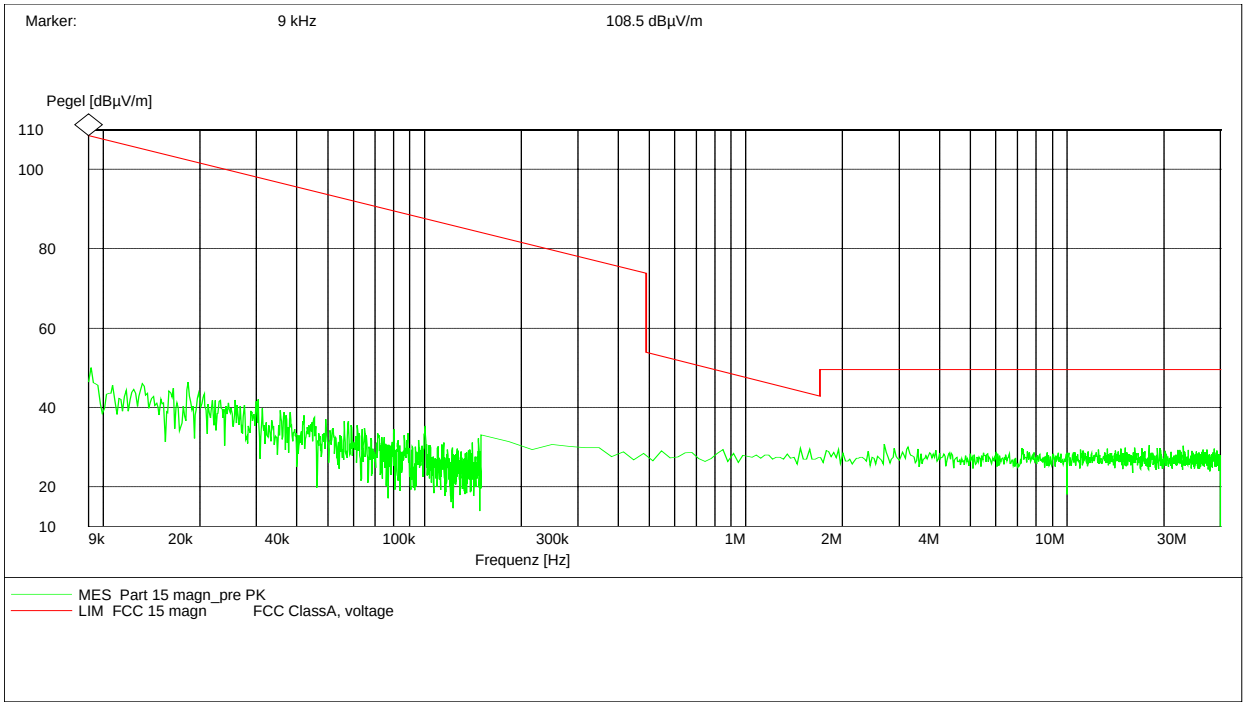



**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

## FCC Rule 47

## Part 15 Magnetics (Valid for PCS 850 and PCS1900)

| | |
|---|---|
| EUT: | Mobile phone 2003a |
| Manufacturer: | Sagem |
| Operating Condition: | with headset 23812517-0 |
| Test Specification: | traffic and idle mode |
| Comment: | pass |




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

## PART PCS 850

## POWER OUTPUT SUBCLAUSE § 24.232

**Summery:**

**This paragraph contains both average , peak output powers and EIRP measurements for the mobile station.**
**In all cases, the peak output power is within the required mask (this mask is specified in the JTC standards, TIA PN3389 Vol. 1 Chap 7, and is no FCC requirement).**

**Method of Measurements:**

**The mobile was set up for the max. output power with pseudo random data modulation.**
**The power was measured with R&S Signal Analyzer FSIQ 26 ( peak and average)**
**This measurements were done at 3 frequencies, 824.2 MHz, 836.2 MHz and 848.8 MHz (bottom, middle and top of operational frequency range)**

**Limits:**

| Power Step | Nominal Peak Output Power (dBm) | Tolerance (dB) |
|---|---|---|
| 5 | +33 | ± 2 |

**Power Measurements:**

**Conducted:**

| Frequency (MHz) | Power Step | Peak Output Power (dBm) | Average Output Power (dBm) |
|---|---|---|---|
| 824.2 | 5 | 33.10 | 33.00 |
| 836.4 | 5 | 33.20 | 33.10 |
| 848.8 | 5 | 33.30 | 33.20 |
| Measurement uncertainty | | ±0.5 dB | |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24; 64**

**EIRP Measurements**

Description: This is the test for the maximum radiated power from the phone.
Rule Part 24.232(b) specifies that "Mobile/portable stations are limited to 2 watts e.i.r.p. peak power…" and 24.232(c) specifies that "Peak transmit power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage."
Method of Measurement:
1. In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference center of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.
2. A "reference path loss" is established as Pin + 2.1 - Pr.
3. The EUT is substituted for the dipole at the reference centre of the chamber. The EUT is put into CW test mode and a scan is performed to obtain the radiation pattern.
4. From the radiation pattern, the co-ordinates where the maximum antenna gain occurs is identified.
5. The EUT is then put into pulse mode at its maximum power level (Power Step 0).
6. "Gated mode" power measurements are performed with the receiving antenna placed at the co-ordinates determined in Step 3 to determine the output power as defined in FCC Rule 24.232 (b) and (c). The "reference path loss" from Step 1 is added to this result.
7. This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.1 dBi) and known input power (Pin).
8. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.1dBi.

**Limits:**

| Power Step | Burst PEAK EIRP (dBm) |
|---|---|
| 0 | <33 |

**Power Measurements ( Radiated )**

| Frequency (MHz) | Power Step | BURST PEAK (dBm) | | MODULATION AVERAGE (dBm) | |
|---|---|---|---|---|---|
| | | EIRP | ERP | EIRP | ERP |
| 824.2 | 5 | 26.20 | 24.10 | 20.20 | 18.10 |
| 836.4 | 5 | 26.20 | 24.10 | 20.20 | 18.10 |
| 848.8 | 5 | 26.30 | 24.20 | 20.30 | 18.20 |
| Measurement uncertainty | | ±3 dB | | | |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## FREQUENCY STABILITY SUBCLAUSE § 24.235

**Method of Measurement:**
In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the mobile station in a “call mode”. This is accomplished with the use of a R&S CMU 200 DIGITAL RADIOCOMMUNICATION TESTER..
1. Measure the carrier frequency at room temperature.
2. Subject the mobile station to overnight soak at -30 C.
3. With the mobile station, powered with 3.6 Volts, connected to the CMU 200 and in a simulated call on channel 661 (centre channel), measure the carrier frequency. These measurements should be made within 2 minutes of powering up the mobile station, to prevent significant self warming.
4. Repeat the above measurements at 10 C increments from -30 C to +60 C. Allow at least 1 1/2 hours at each temperature, un-powered, before making measurements.
5. Re-measure carrier frequency at room temperature with nominal 3.6 Volts. Vary supply voltage from minimum 3.3 Volts to maximum 4.4 Volts, in 13 steps re-measuring carrier frequency at each voltage. Pause at 3.7 V ac Volts for 1 1/2 hours un-powered, to allow any self heating to stabilize, before continuing.
6. Subject the mobile station to overnight soak at +60 C.
7. With the mobile station, powered with 3.7 Volts, connected to the CMU 200 and in a simulated call on channel 661(center channel), measure the carrier frequency. These measurements should be made within 2 minutes of powering up the mobile station, to prevent significant self warming.
8. Repeat the above measurements at 10 C increments from +60 C to -30 C. Allow at least 1 1/2 hours at each temperature, un-powered, before making measurements.
9. At all temperature levels hold the temperature to +/- 0.5 C during the measurement procedure.

**Measurement Limit:**

According to the JTC standard the frequency stability of the carrier shall be accurate to within 0.1 ppm of the received frequency from the base station. This accuracy is sufficient to meet Sec. 24.235, Frequency Stability. The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.. This transceiver is specified to operate with an input voltage of between 3.3 V dc and 4.4 V dc, with a nominal voltage of 3.8 V dc.

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

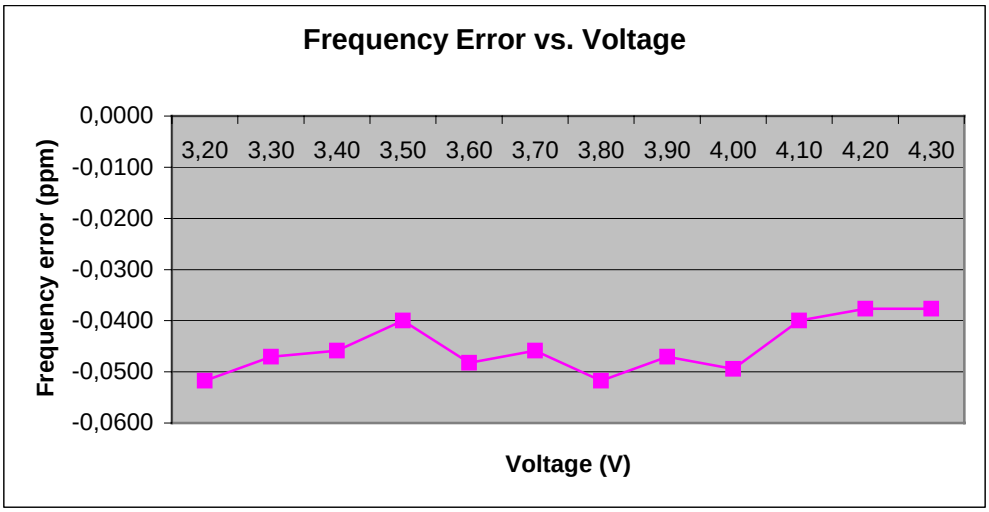
**AFC FREQ ERROR vs. VOLTAGE**

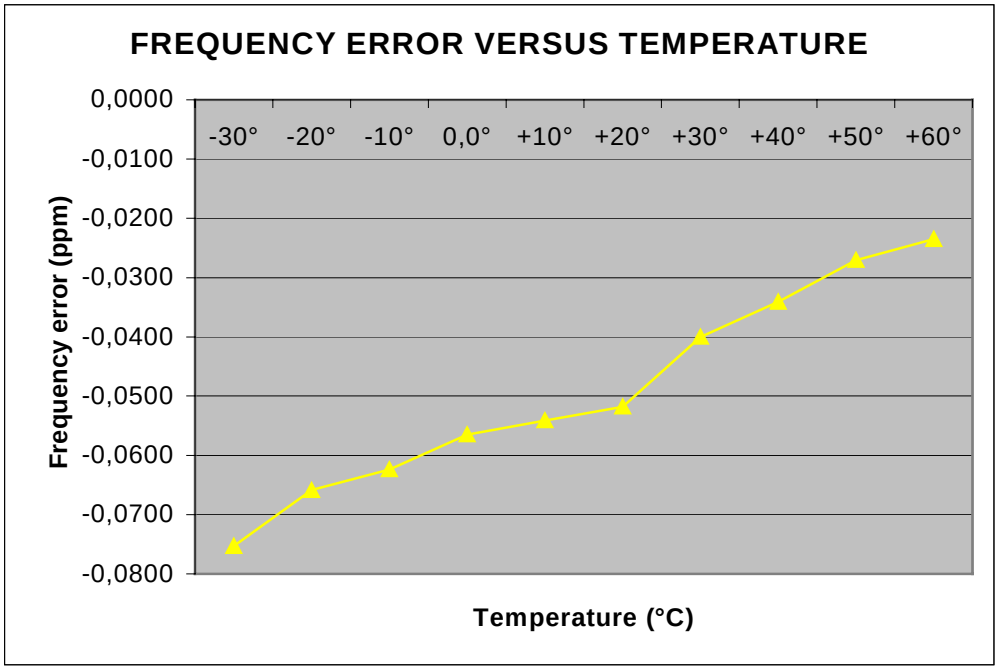
| Voltage (V) | Frequency Error (Hz) | Frequency Error (%) | Frequency Error (ppm) |
|---|---|---|---|
| 3.3 | -44 | -0,00000518 | -0,0518 |
| 3.4 | -40 | -0,00000471 | -0,0471 |
| 3.5 | -39 | -0,00000459 | -0,0459 |
| 3.6 | -34 | -0,00000400 | -0,0400 |
| 3.7 | -41 | -0,00000482 | -0,0482 |
| 3.8 | -39 | -0,00000459 | -0,0459 |
| 3.9 | -44 | -0,00000518 | -0,0518 |
| 4.0 | -40 | -0,00000471 | -0,0471 |
| 4.1 | -42 | -0,00000494 | -0,0494 |
| 4.2 | -34 | -0,00000400 | -0,0400 |
| 4.3 | -32 | -0,00000376 | -0,0376 |
| 4.4 | -32 | -0,00000376 | -0,0376 |

**AFC FREQ ERROR vs. TEMPERATURE**

| TEMPERATURE (°C) | Frequency Error (Hz) | Frequency Error (%) | Frequency Error (ppm) |
|---|---|---|---|
| -30 | -64 | -0,00000753 | -0,0753 |
| -20 | -56 | -0,00000659 | -0,0659 |
| -10 | -53 | -0,00000624 | -0,0624 |
| ±0.0 | -48 | -0,00000565 | -0,0565 |
| +10 | -46 | -0,00000541 | -0,0541 |
| +20 | -44 | -0,00000518 | -0,0518 |
| +30 | -34 | -0,00000400 | -0,0400 |
| +40 | -29 | -0,00000341 | -0,0341 |
| +50 | -23 | -0,00000271 | -0,0271 |
| +60 | -20 | -0,00000235 | -0,0235 |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## EMISSIONS LIMITS §24.238

**Measurement Procedure:**

The following steps outline the procedure used to measure the radiated emissions from the mobile station. The site is constructed in accordance with ANSI C63.4 – 1992 requirements and is recognized by the FCC to be in compliance for a 3 and a10 meter site. The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier that can be as high as 848.8 MHz. This was rounded up to 12 GHz. The resolution bandwidth is set as outlined in Part 24.238. The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the USPCS band.

**The final open field emission ( here 10m semi-anechoic chamber listed by FCC) test procedure is as follows:**
a) The test item was placed on a 0. 8 meter high non-conductive stand at a 3 meter test distance from the receive antenna.
b) The antenna output was terminated in a 50 ohm load.
c) A double ridged waveguide antenna was placed on an adjustable height antenna mast 3 meters from the test item for emission measurements.
d) Detected emissions were maximized at each frequency by rotating the test item and adjusting the receive antenna height and polarization. The maximum meter reading was recorded. The radiated emission measurements of the harmonics of the transmit frequency through the 10th harmonic were measured with peak detector and I MHz bandwidth. If the harmonic could not be detected above the noise floor, the ambient level was recorded. The equivalent power into a dipole antenna was calculated from the field intensity levels measured at 3 meters using the equation shown below:
e)Now each detected emissions were substituted by the Substitution method, in accordance with the TIA/EIA 603 .

**Measurement Limit:**
Sec. 24.238 Emission Limits.
(a) On any frequency outside a licensee' s frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 - 24**

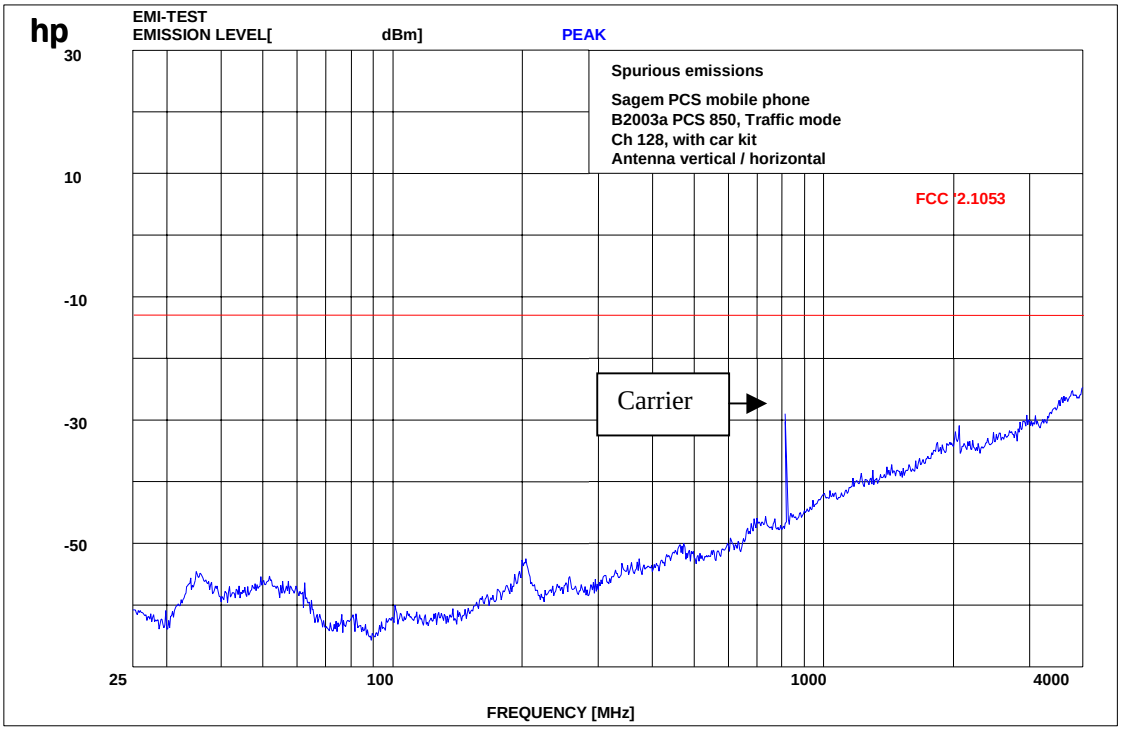
**Measurement Results:**
Radiated emissions measurements were made only at the upper, center, and lower carrier frequencies of the USPCS band (824.2 MHz, 836.2 MHz and 848.8 MHz). It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the USPCS band into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this.

**RESULTS OF OPEN FIELD RADIATED TEST FOR FCC-24:**
The final open field radiated levels are presented on the next pages.
**All measurements were done in horizontal and vertical polarization, the plots shows the worst case.**
**As can be seen from this data, the emissions from the test item were within the specification limit.**

| EMISSION LIMITATIONS | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| **f (MHz)** | | **amplitude of emission (dBm)** | **limit max. allowed emission power (dBm)** | **actual attenuation below frequency of operation (dBc)** | **results** |
| **CH 128** | | | | | |
| **824.2** | | **25.10** | **-13.0 (38.20 dBc)** | | **carrier** |
| **4128.0** | | **-35.10** | | **60.60** | **complies** |
| | | | | | |
| | | | | | |
| | | | | | |
| **CH 189** | | | | | |
| **836.4** | | **25.50** | **-13.0 (39.20 dBc)** | | **carrier** |
| **4182.0** | | **-41.40** | | **66.90** | **complies** |
| | | | | | |
| | | | | | |
| **CH 251** | | | | | |
| **848.8** | | **25.30** | **-13.0 (39.40 dBc)** | | **carrier** |
| **4244.0** | | **-46.8** | | **72.1** | **complies** |
| | | | | | |
| | | | | | |
| **Measurement uncertainty** | | | **± 0.5dB** | | |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 - 24**

## Channel 128 (up to 4 GHz )

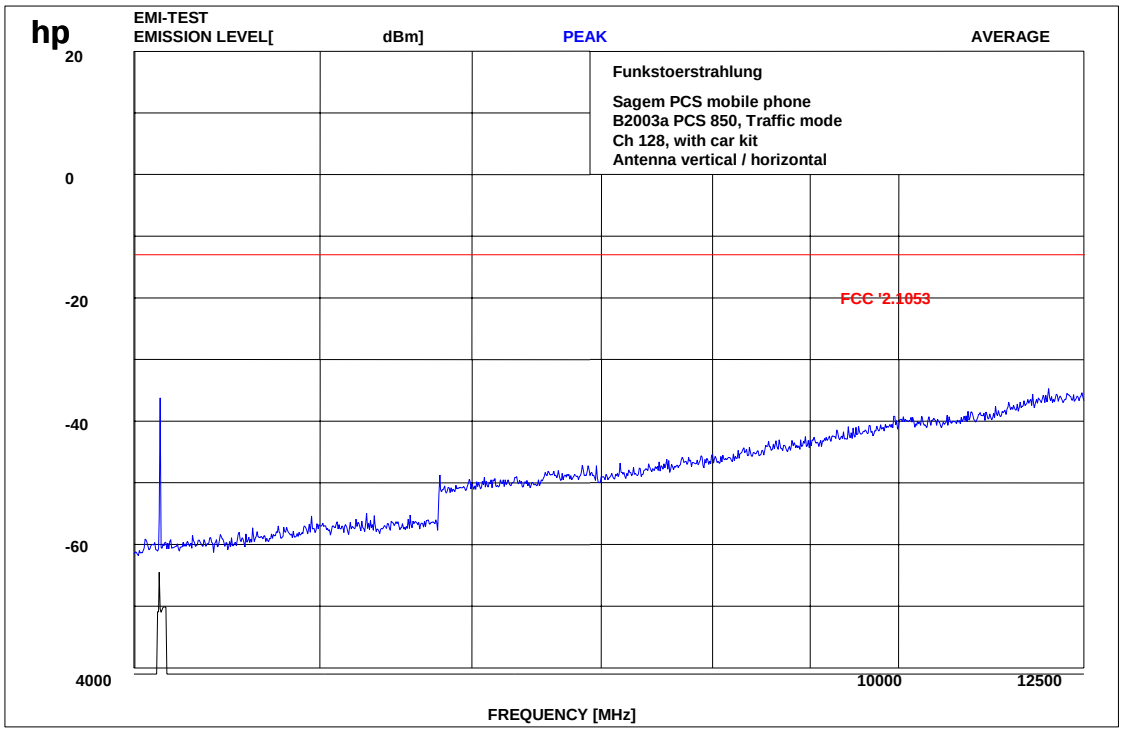



**f < 1 GHz : RBW/VBW: 100 kHz** **f ≥ 1GHz : RBW/VBW 1 MHz**

**Carrier suppressed with a rejection filter**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 - 24**

## Channel 128 (up to 12 GHz )

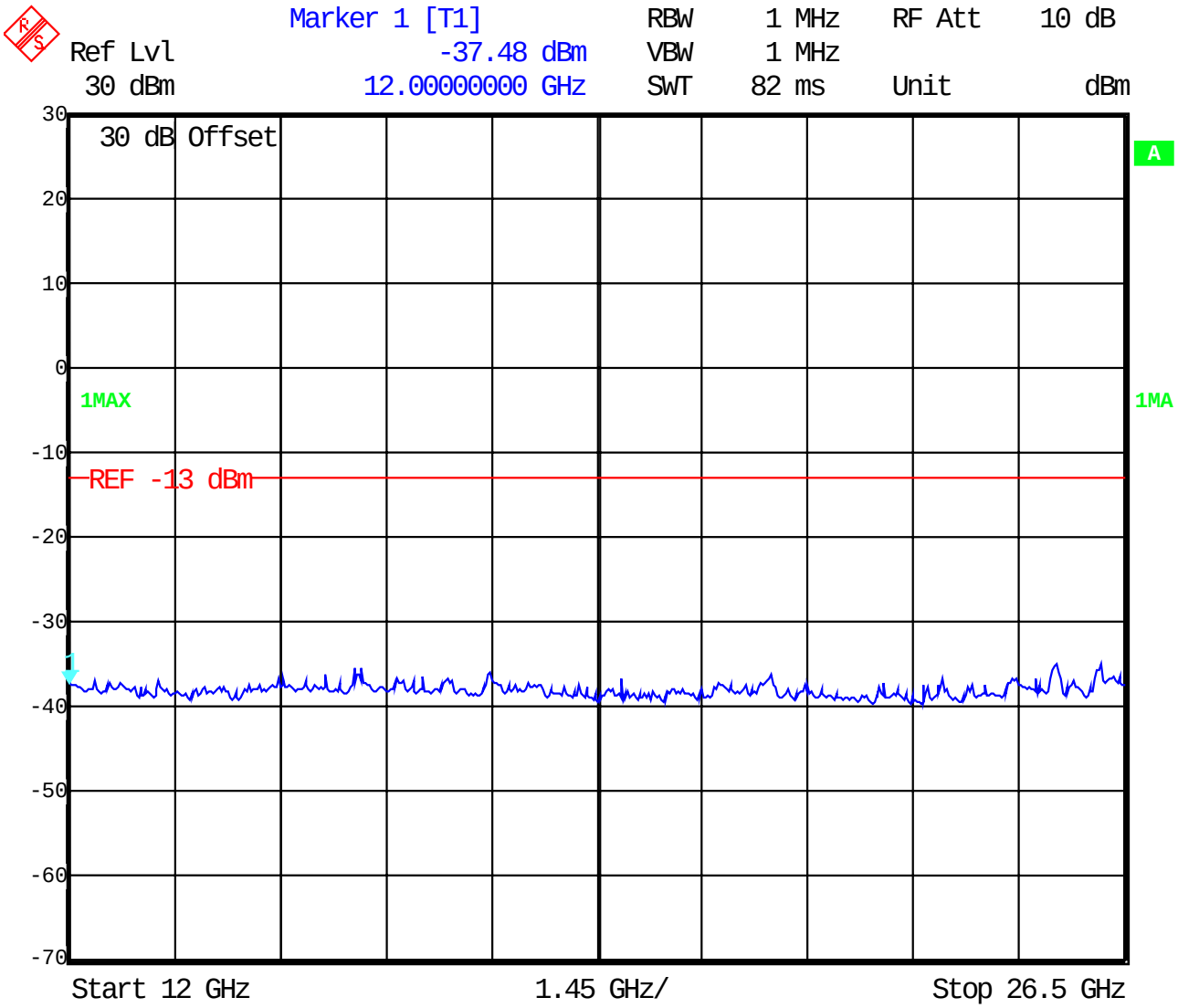



**f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW 1 MHz**

**Carrier suppressed with a rejection filter**

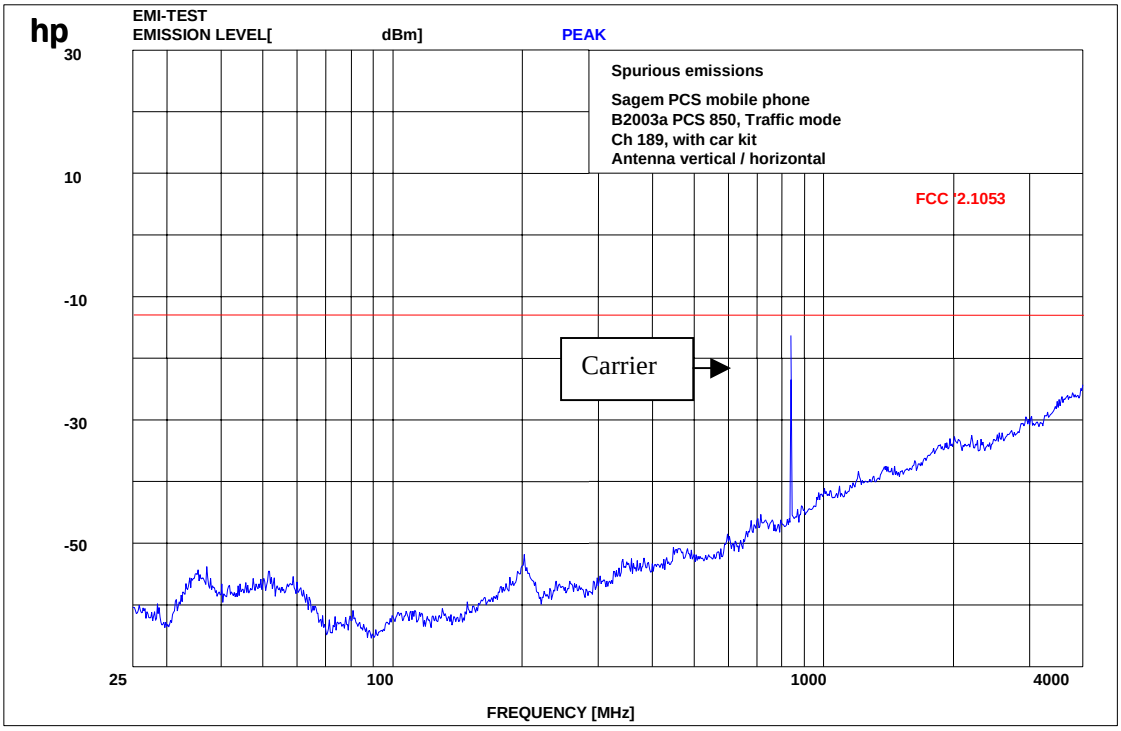
**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 - 24**

**Channel 128 :– 25 GHz**




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 - 24**

## Channel 189 (up to 4 GHz )

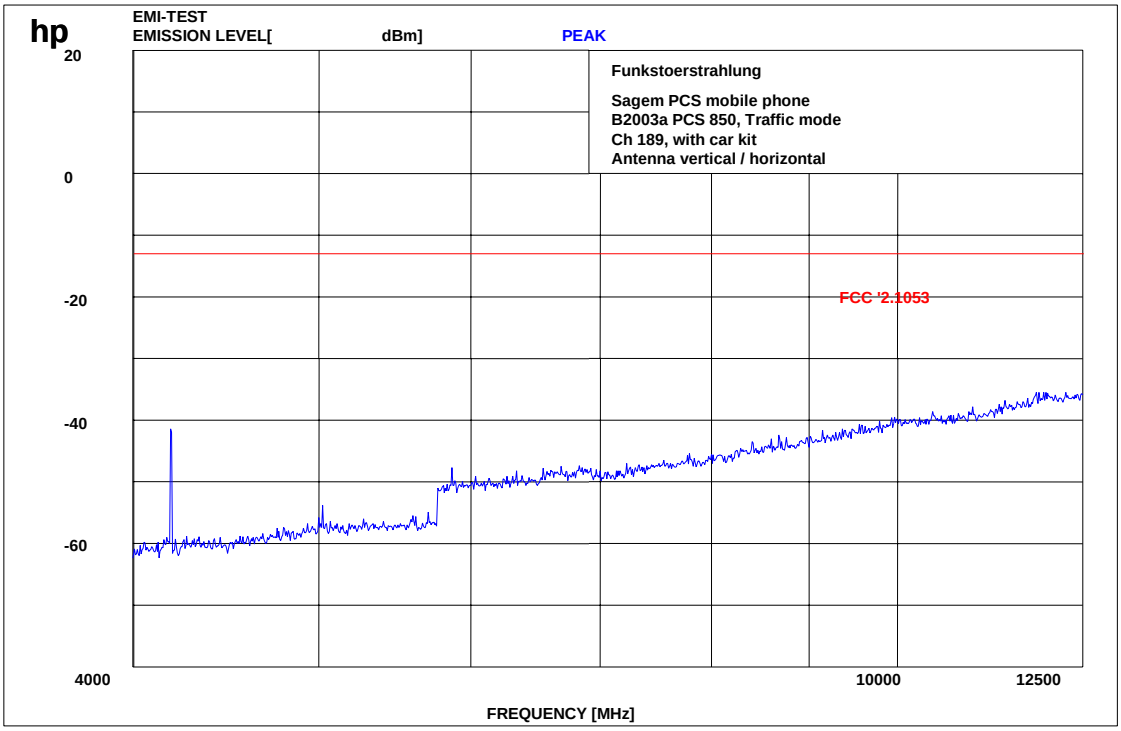



**f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW 1 MHz**

**Carrier suppressed with a rejection filter**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 - 24**

## Channel 189 (up to 12 GHz )

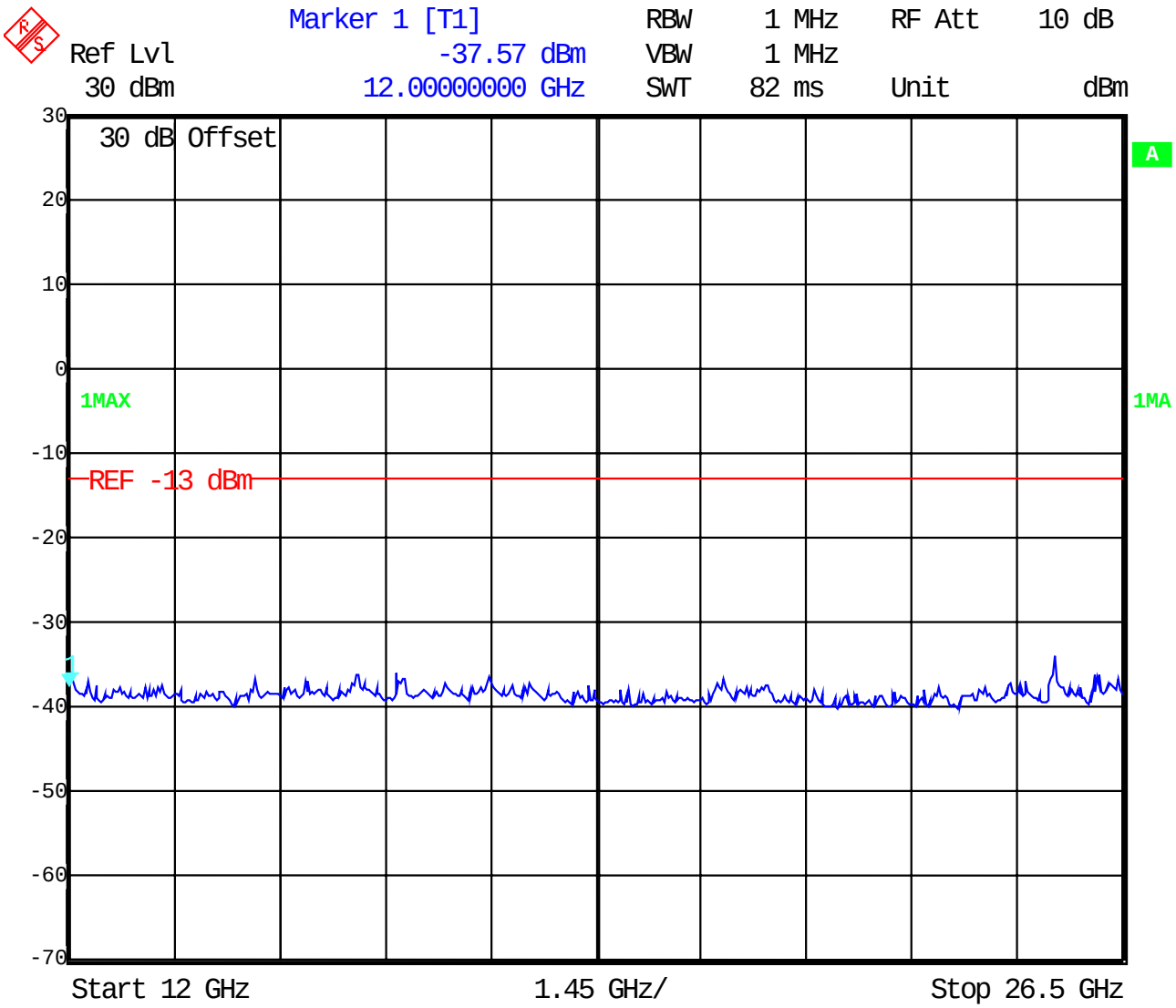



**f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW 1 MHz**

**Carrier suppressed with a rejection filter**

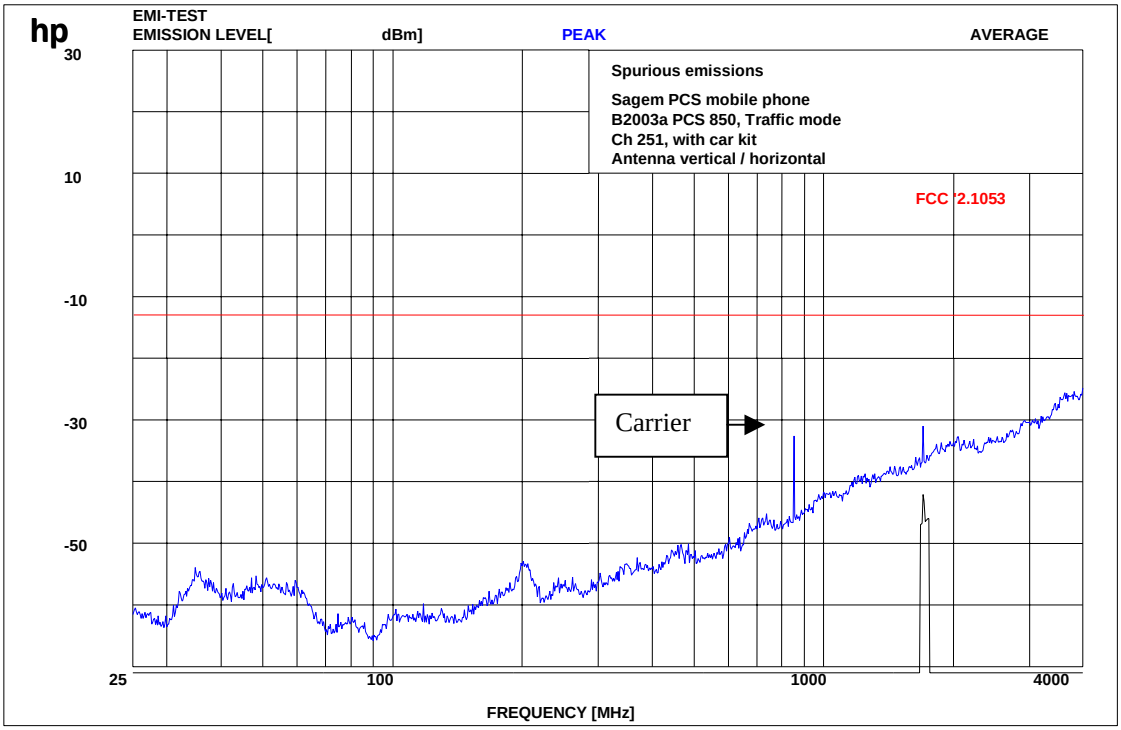
**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 - 24**

**Channel 189 : -25 GHz**




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 - 24**

## Channel 251 up to 4 GHz

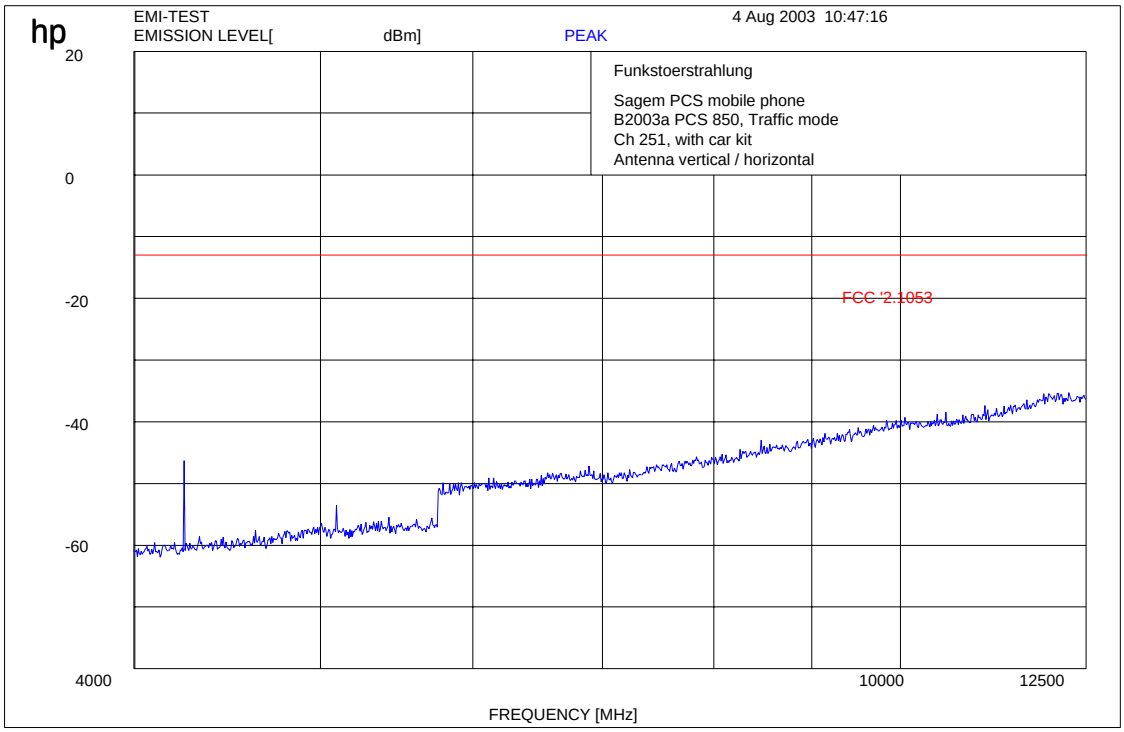



**f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW 1 MHz**

**Carrier suppressed with a rejection filter**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 - 24**

## Channel 251 up to 12 GHz

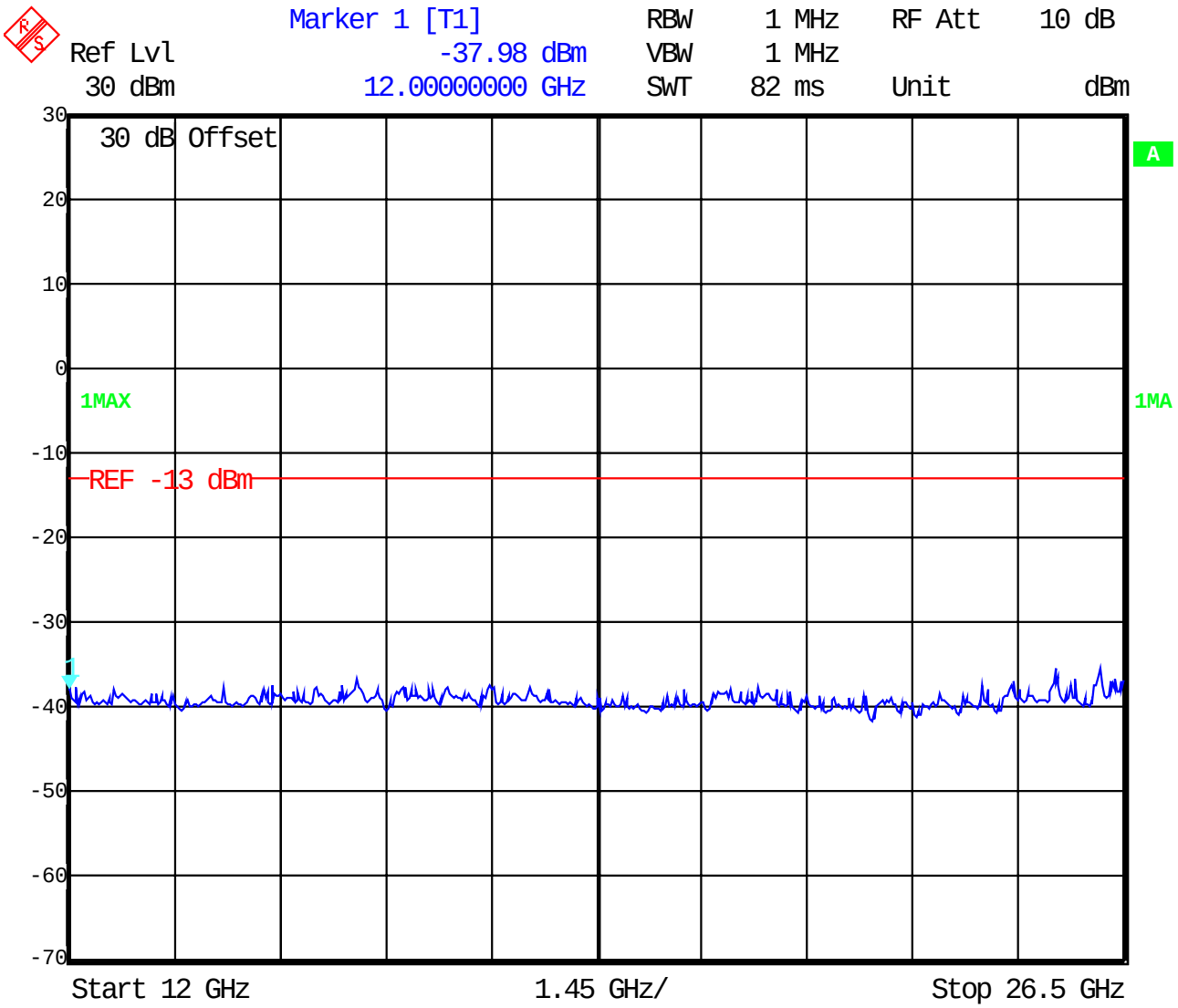



**f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW 1 MHz**

**Carrier suppressed with a rejection filter**

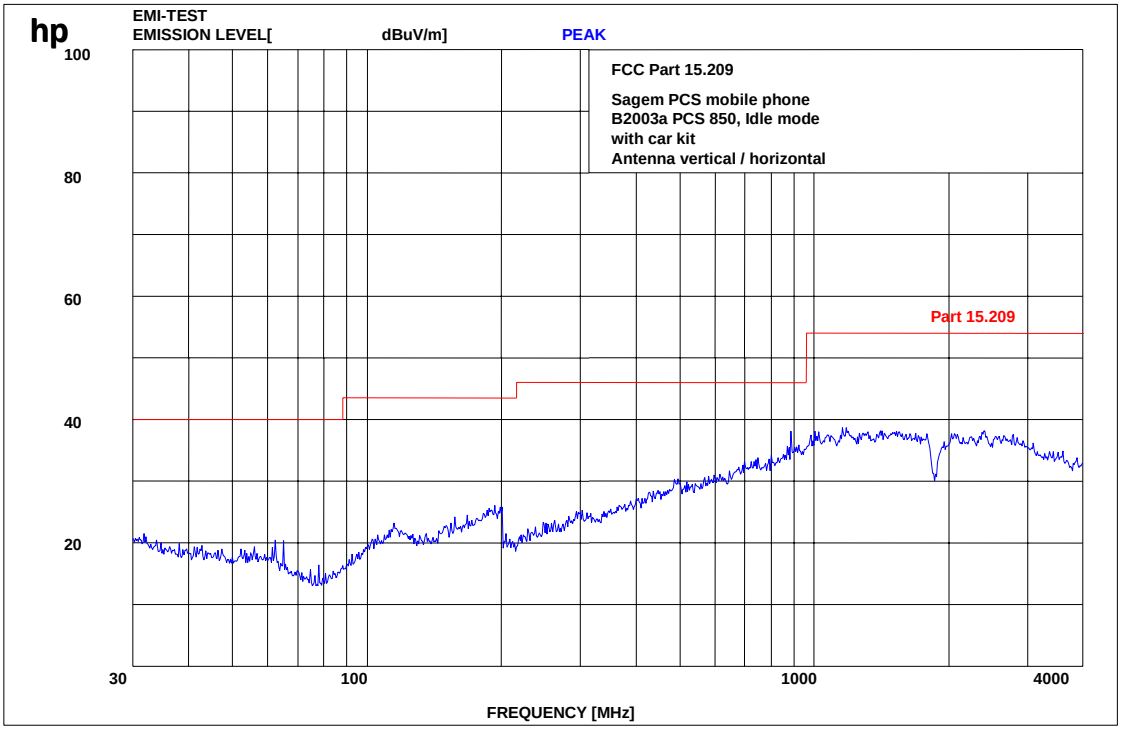
**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 - 24**

**Channel 251 : -25 GHz**




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 - 24**

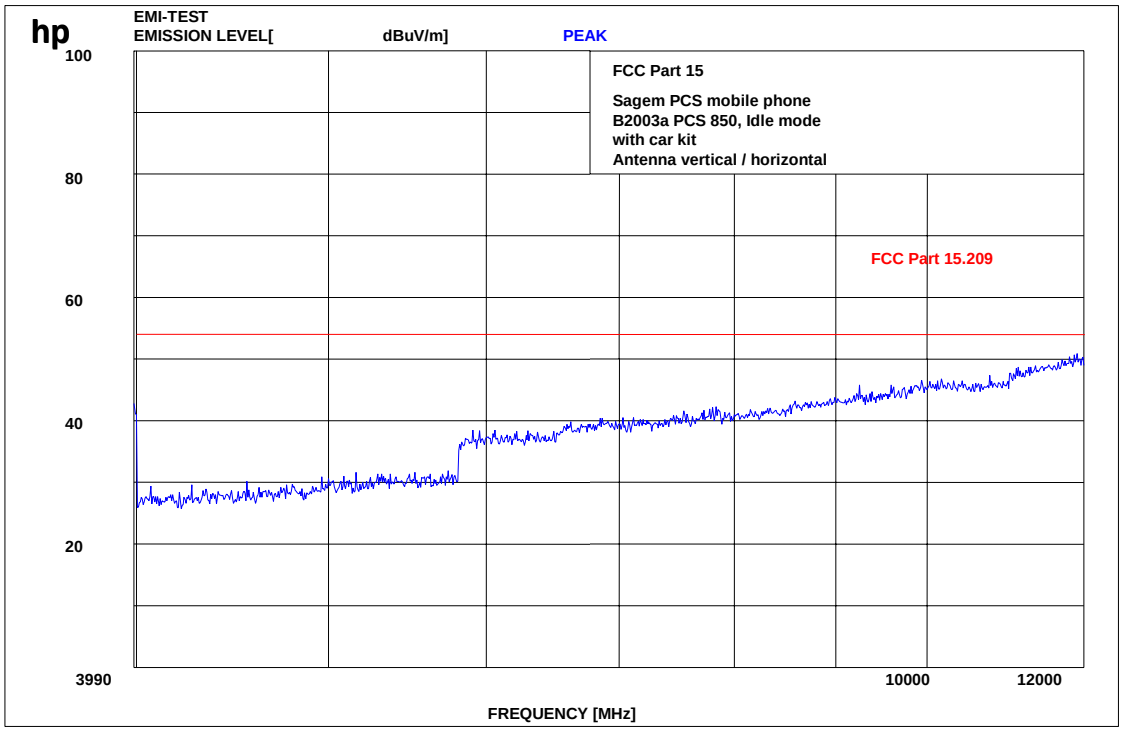
**Idle-Mode (this is valid for all channels and up to 4 GHz)**




**f < 1 GHz : RBW/VBW: 100 kHz** **f ≥ 1GHz : RBW/VBW 1 MHz**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

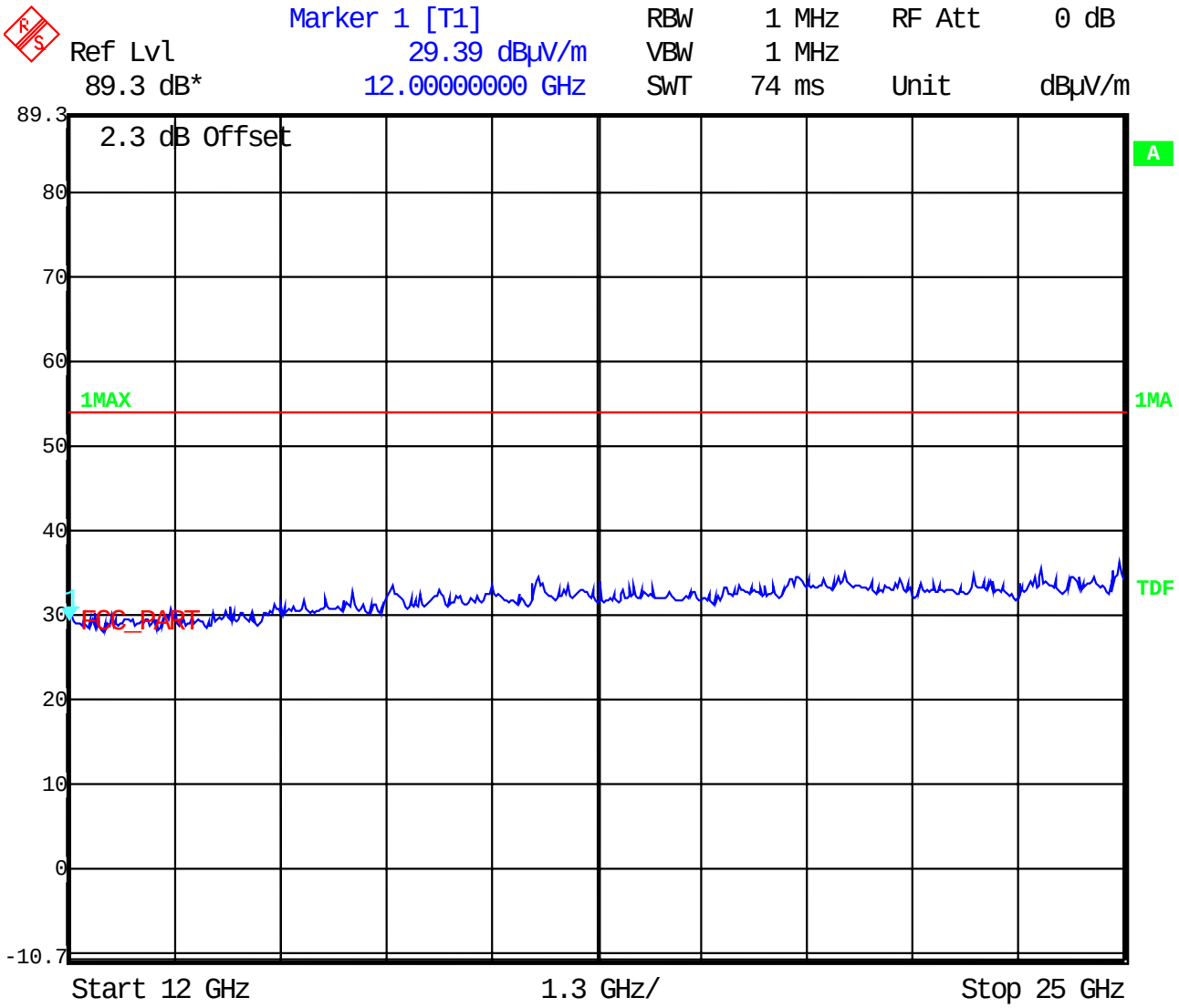
**Idle-Mode (this is valid for all channels and up to 12 GHz)**




**f < 1 GHz : RBW/VBW: 100 kHz** **f ≥ 1GHz : RBW/VBW 1 MHz**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

**this is valid for all 3 channels and up to 25 GHz**




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## CONDUCTED SPURIOUS EMISSIONS

**Measurement Procedure:**
The following steps outline the procedure used to measure the conducted emissions from the mobile station.
1. Determine frequency range for measurements: From CFR 2.1057 the spectrum should be investigated from the lowest radio frequency generated in the equipment up to at least the 10th harmonic of the carrier frequency.
For the mobile station equipment tested, this equates to a frequency range of 13 MHz to 19.1 GHz, data taken from 10 MHz to 20 GHz.
2. Determine mobile station transmit frequencies: below outlines the band edge frequencies pertinent to conducted emissions testing.
**USPCS Transmitter**
**Channel Frequency**
128 824.2 MHz
189 836.2 MHz
251 848.8 MHz

**Measurement Limit:**
Sec. 24.238 Emission Limits.
(a) On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

| EMISSION LIMITATIONS | | | | | |
|---|---|---|---|---|---|
| **f (MHz)** | | **amplitude of emission (dBm)** | **limit max. allowed emission power (dBm)** | **actual attenuation below frequency of operation (dBc)** | **results** |
| **CH 128** | | | | | |
| **13.20** | | **-27.44** | **-13.0 (45.10 dBc)** | **59.54** | |
| **824,2** | | **32.10** | | | **carrier** |
| **823.975** | | **-13.54** | | **45.64** | **complies** |
| **1643.5** | | **-31.32** | | **63.42** | **complies** |
| | | | | | |
| | | | | | |
| **CH 189** | | | | | |
| **13.40** | | **-27.14** | **-13.0 (45.20 dBc)** | **59.34** | |
| **836,4** | | **32.20** | | | **carrier** |
| **1663.5** | | **-30.77** | | **62.97** | **complies** |
| | | | | | |
| | | | | | |
| **CH 251** | | | | | |
| **13.52** | | **-27.49** | **-13.0 (45.30 dBc)** | **59.79** | |
| **848,8** | | **32.30** | | | **carrier** |
| **849.02** | | **-13.99** | | **46.29** | **complies** |
| **1694.3** | | **-32.08** | | **64.38** | **complies** |
| | | | | | |

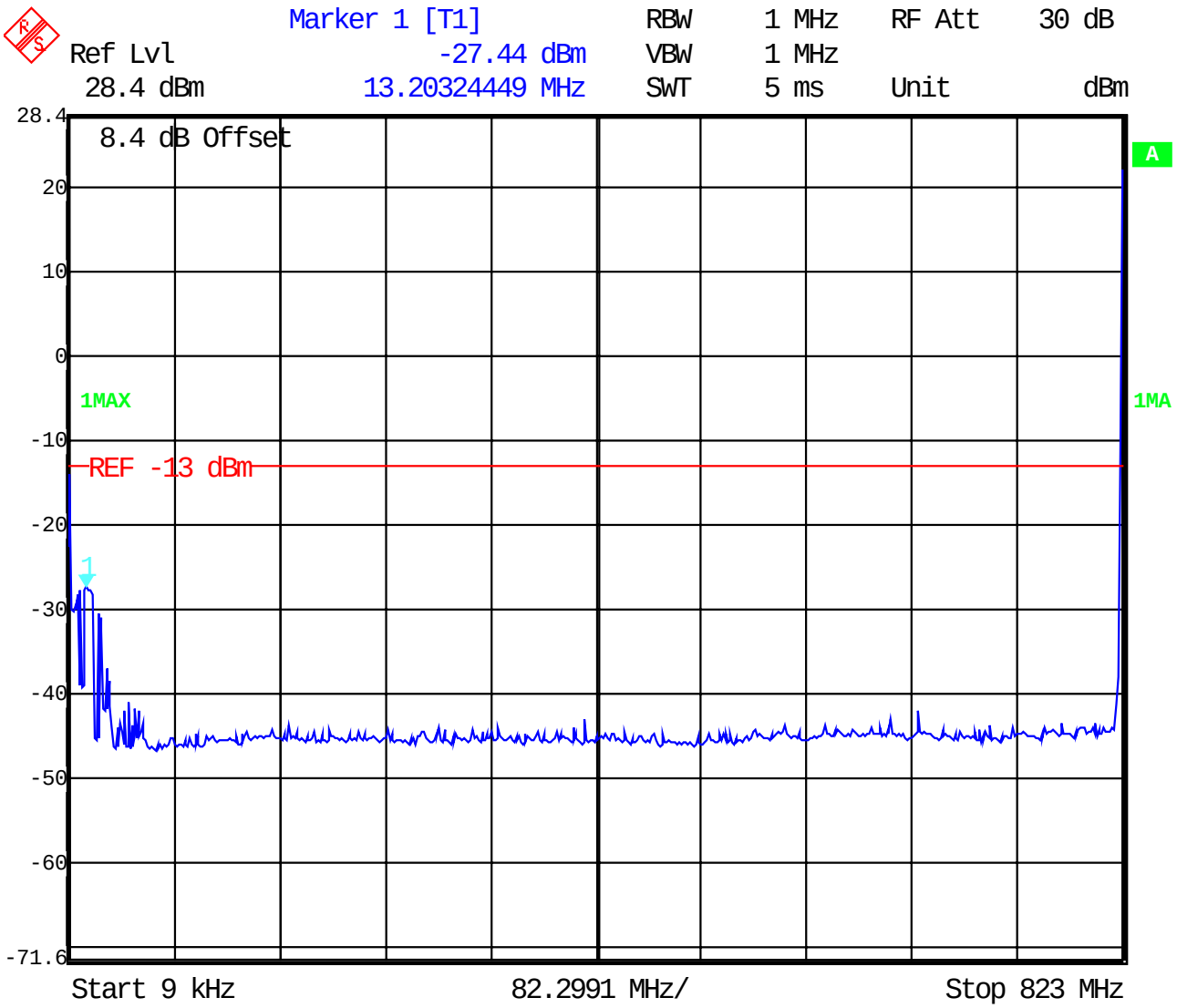
**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

| | |
|---|---|
| **Measurement uncertainty** | **± 0.5dB** |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

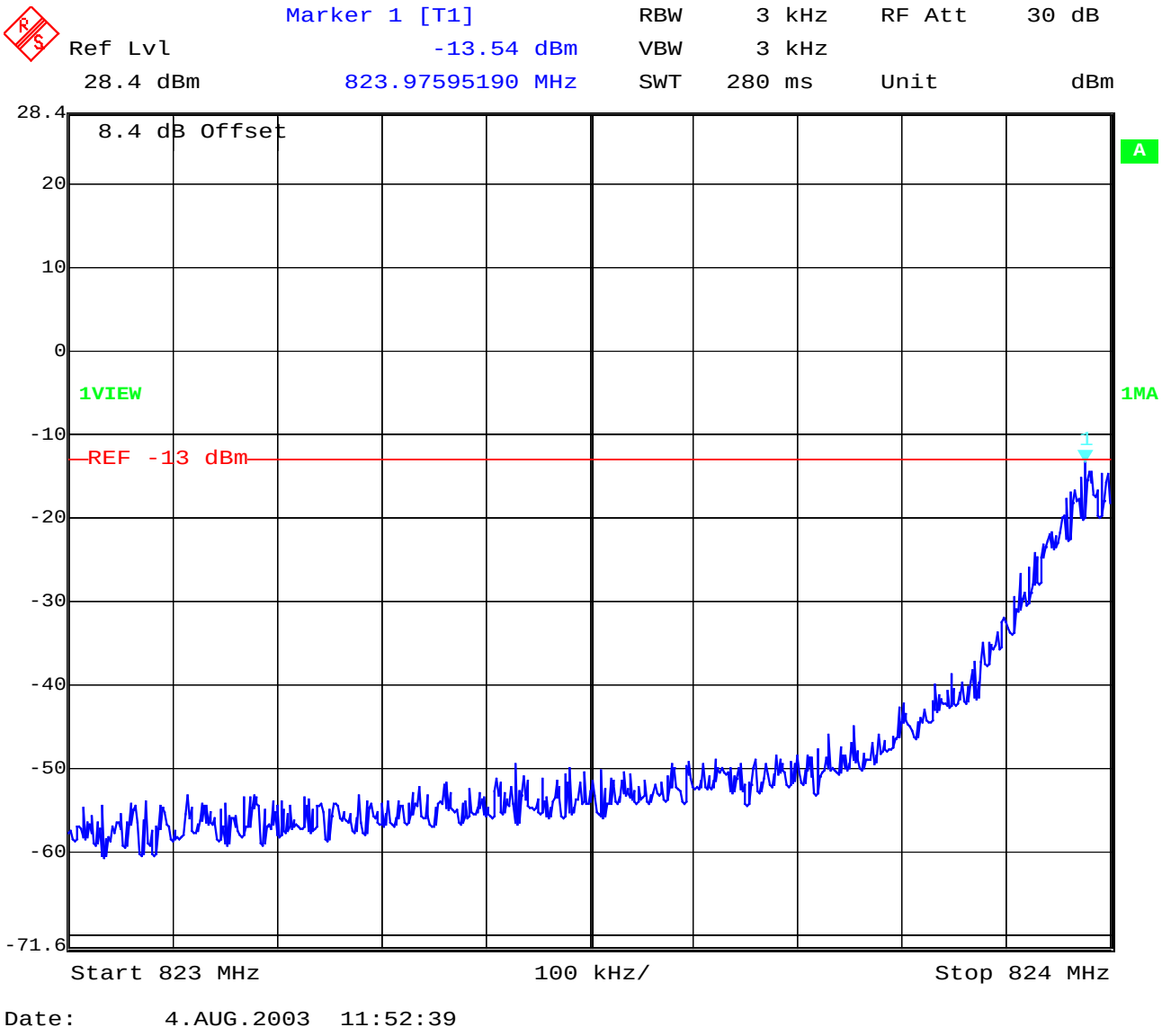
**Measurements:**

**Channel: 128**



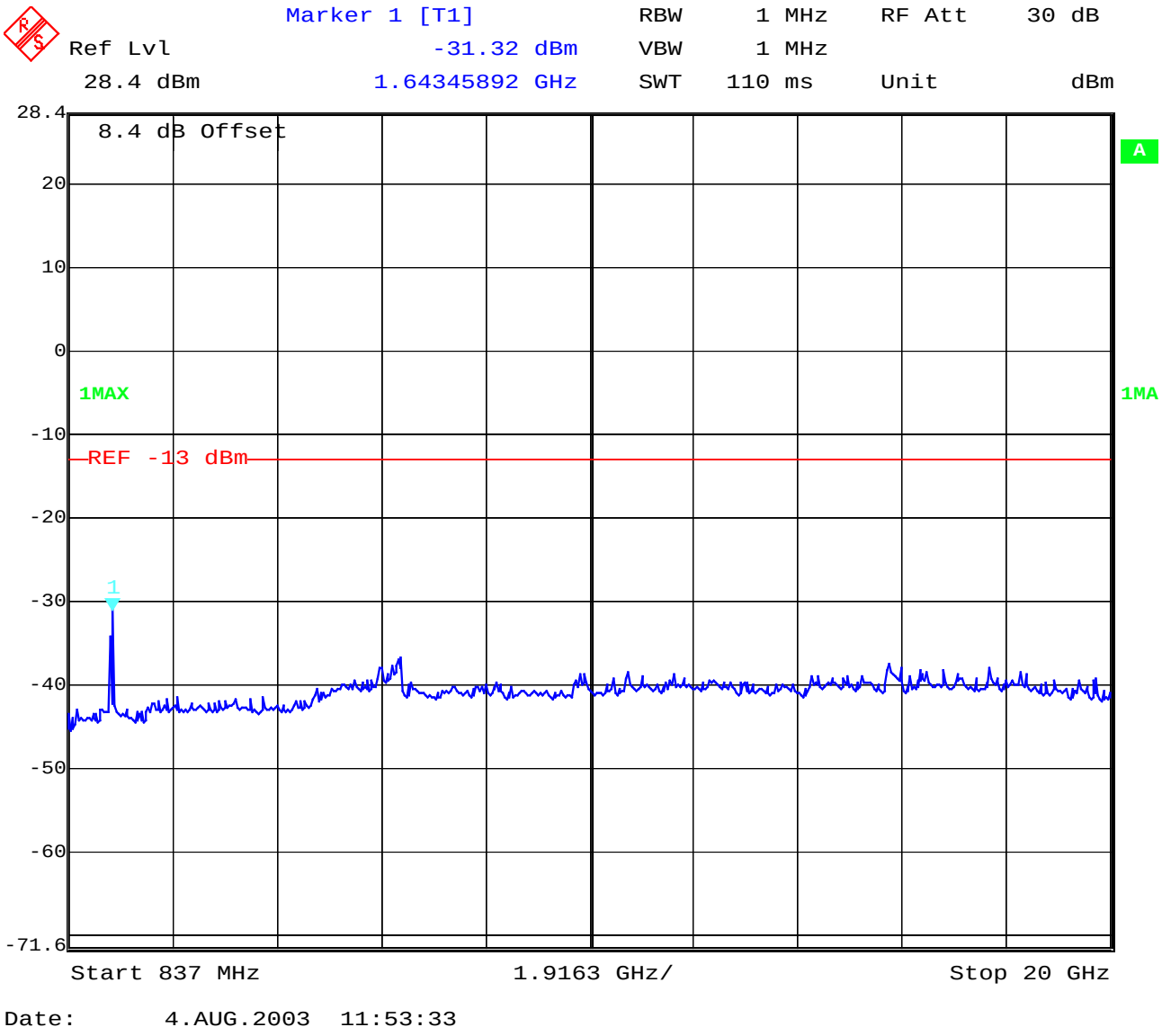

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

## Channel 128



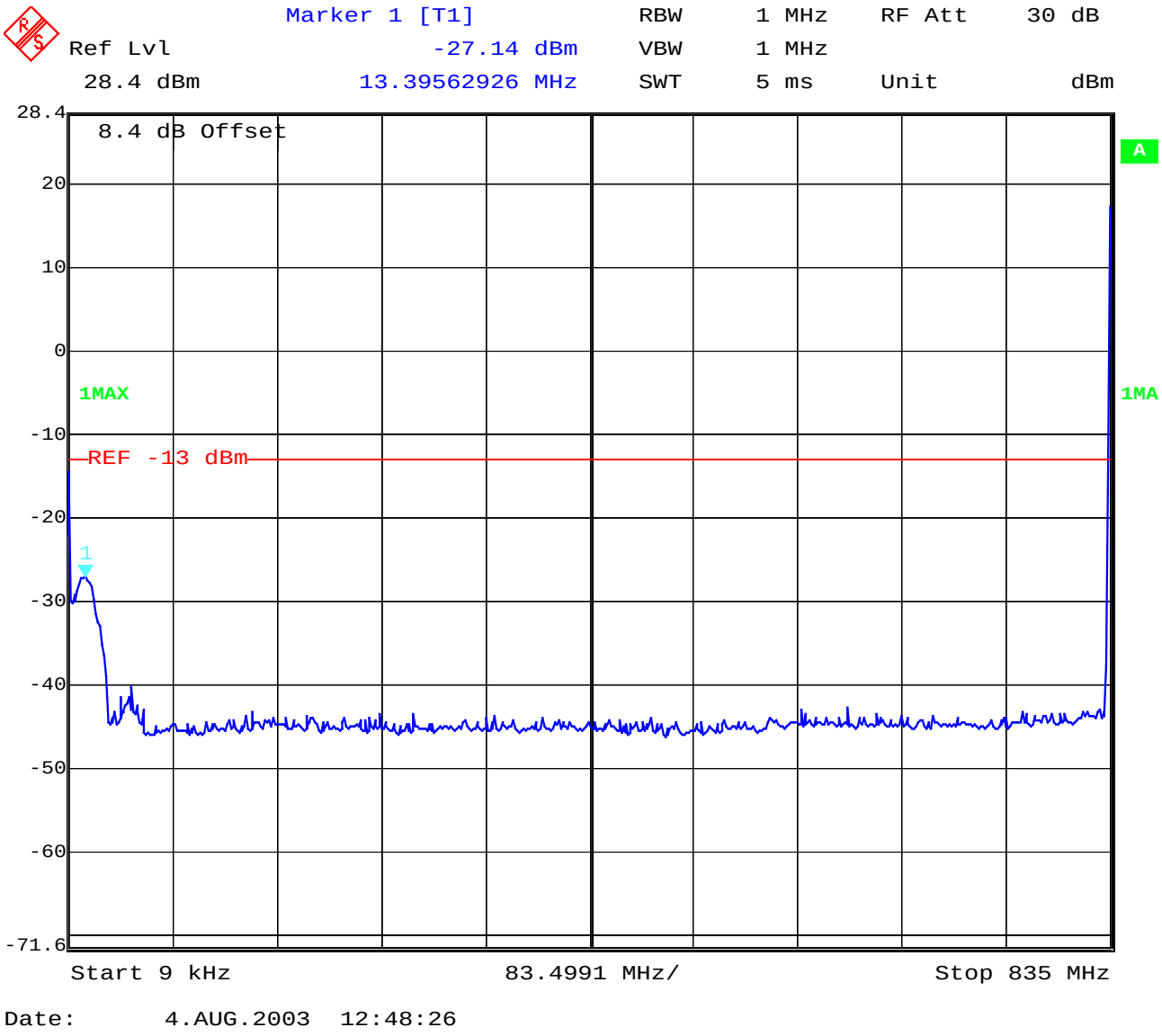

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## Channel 128



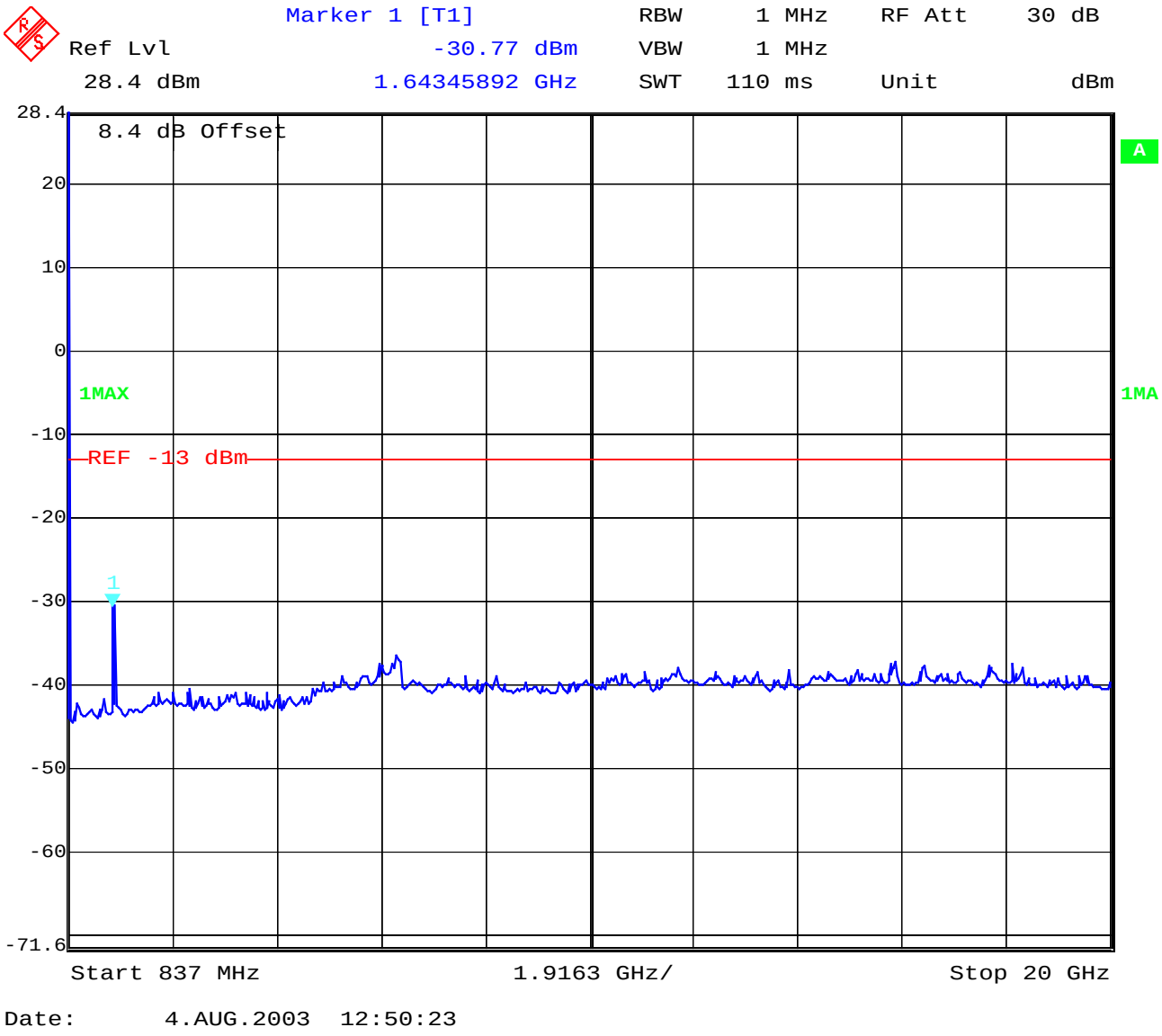

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## Channel 189



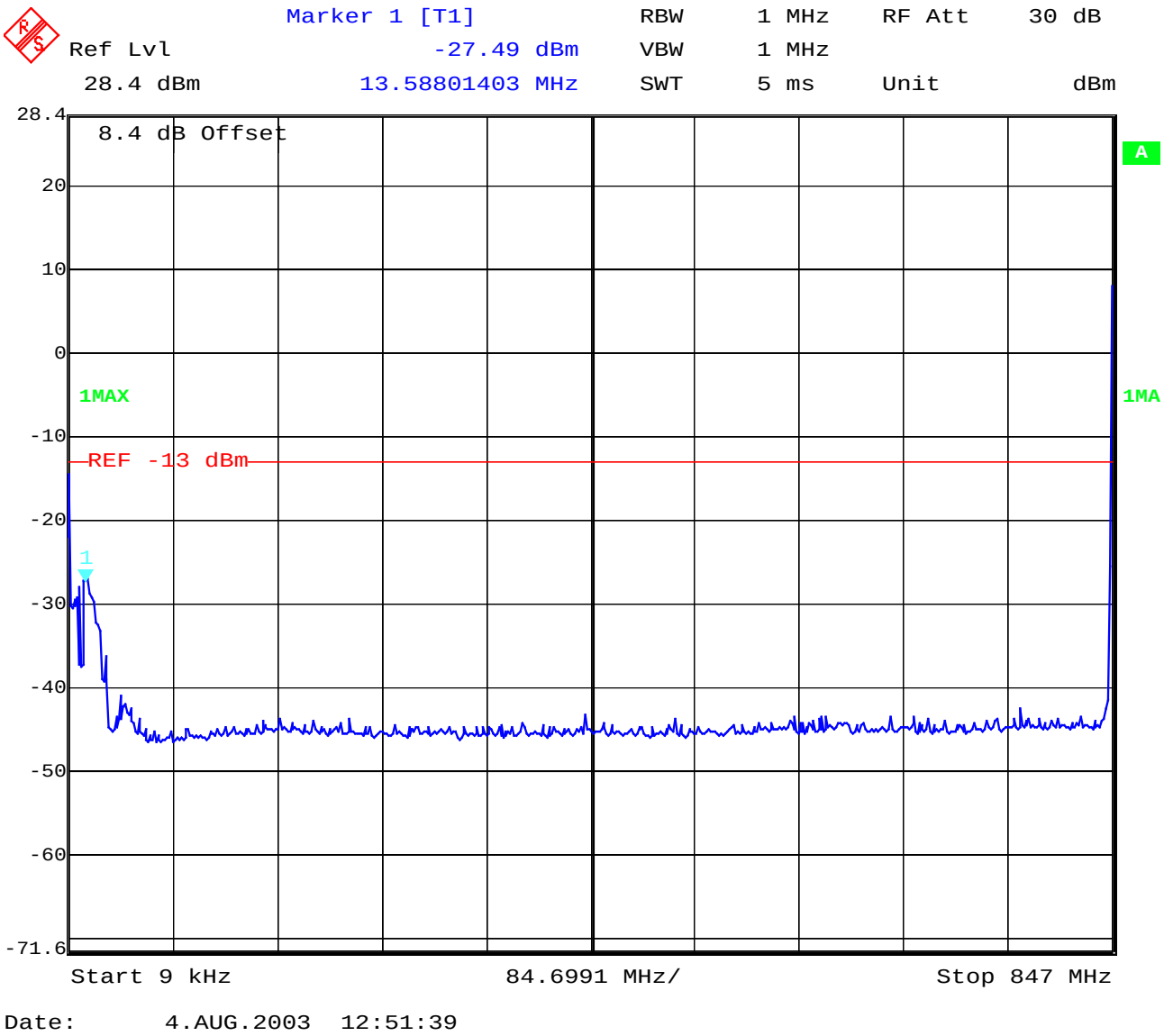

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## Channel 189



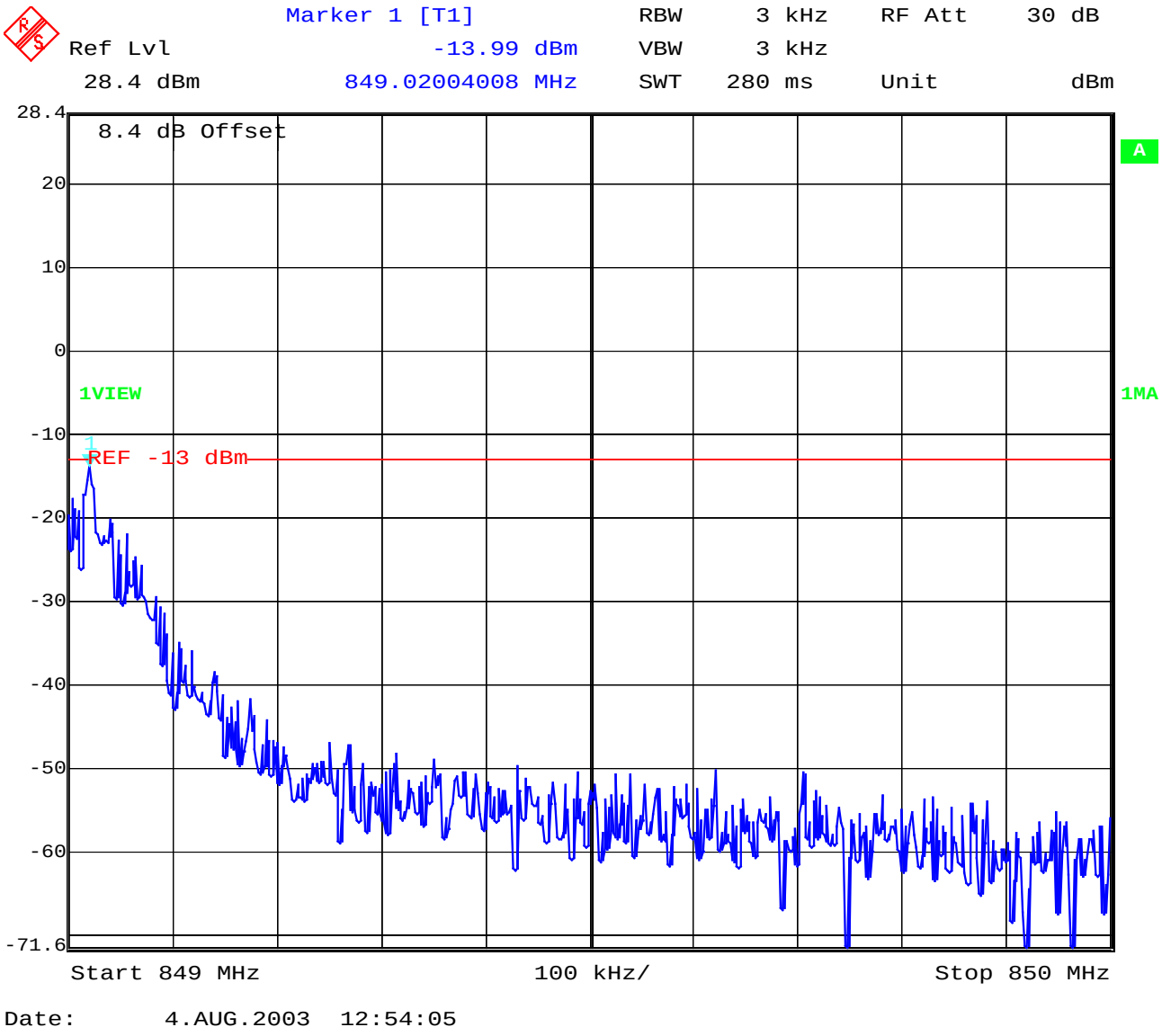

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## Channel 251



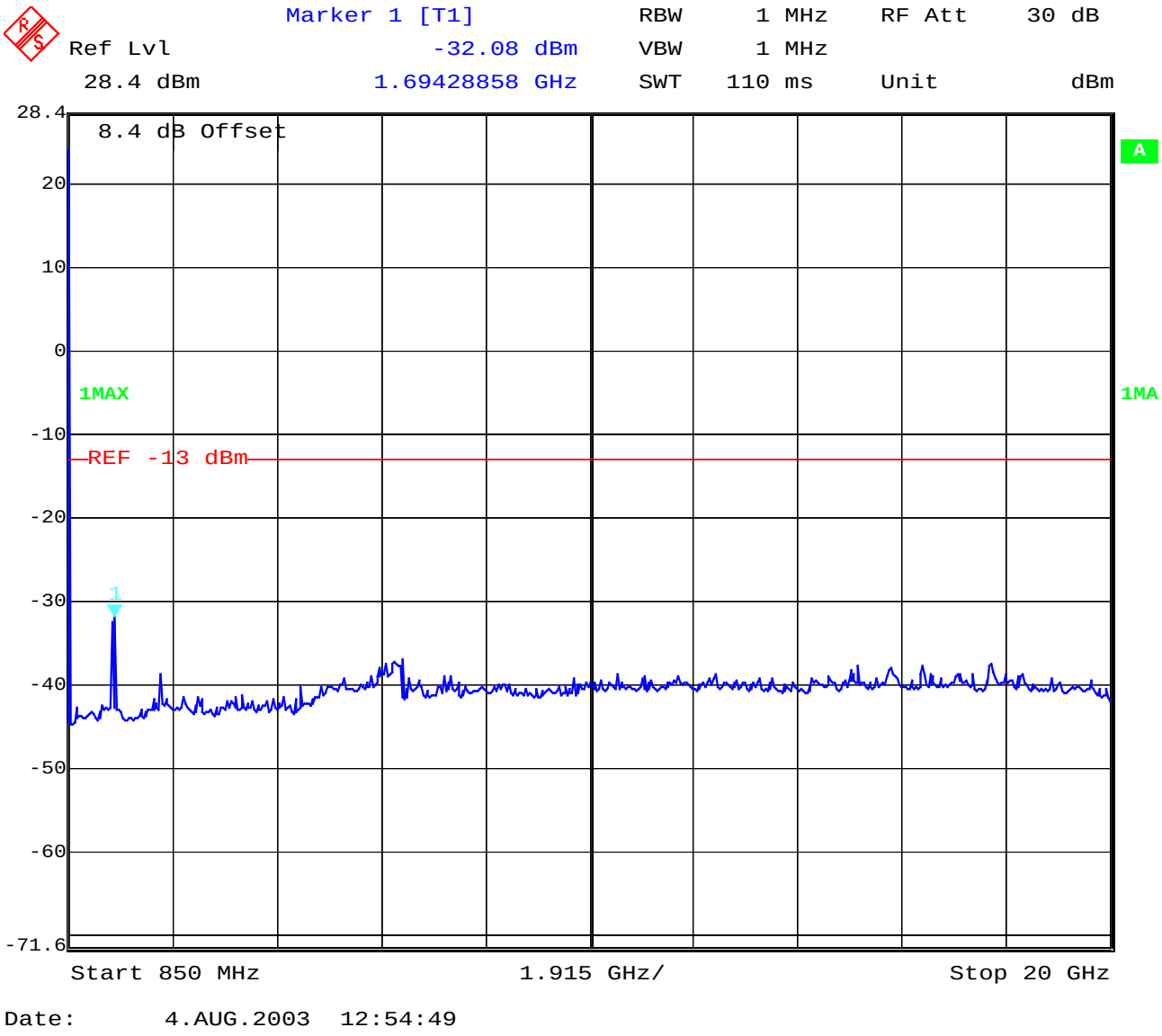

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## Channel 251




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## Channel 251

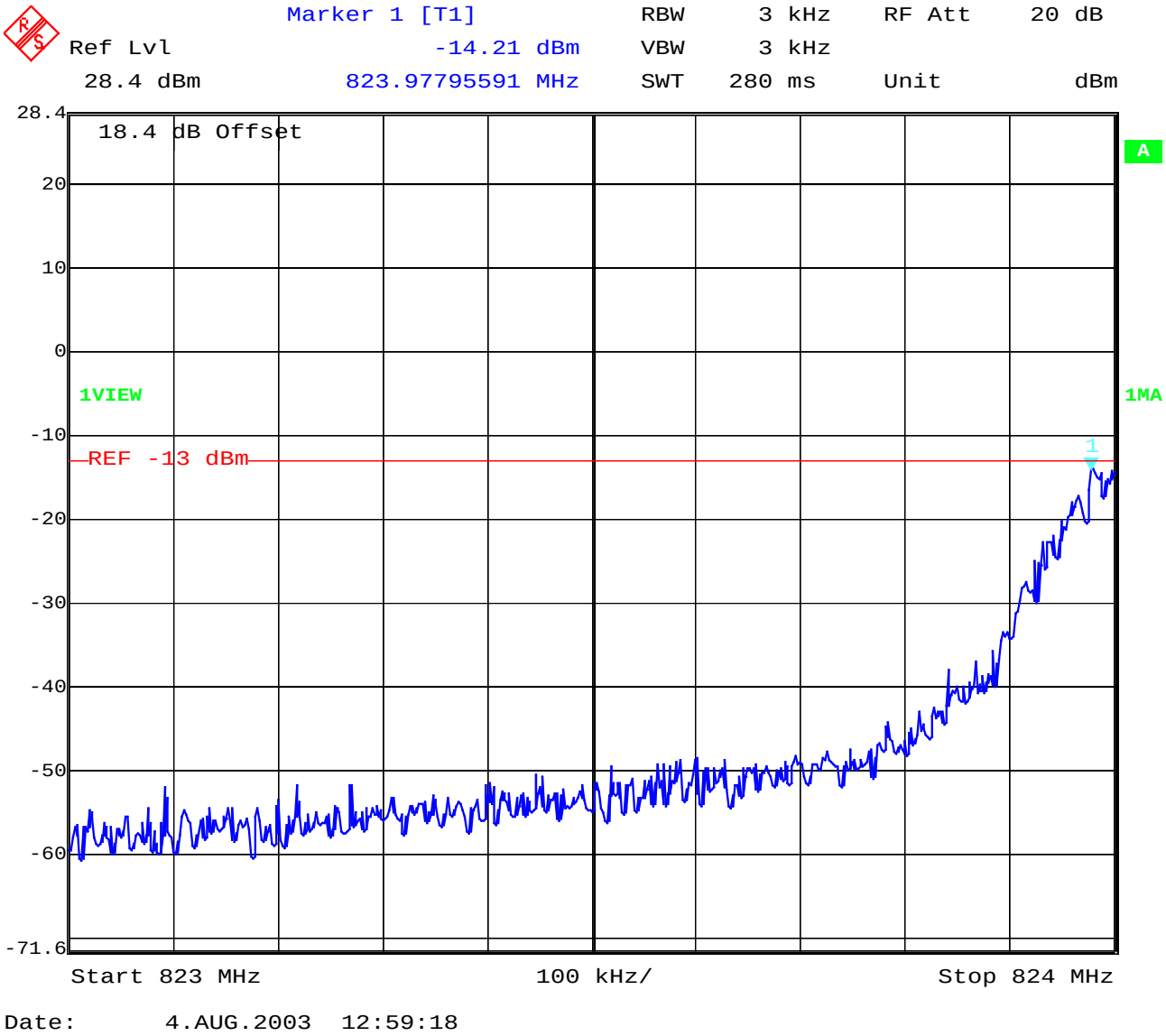



**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## BLOCK EDGE REQUIREMENTS FOR BLOCK 1 TO BLOCK 4

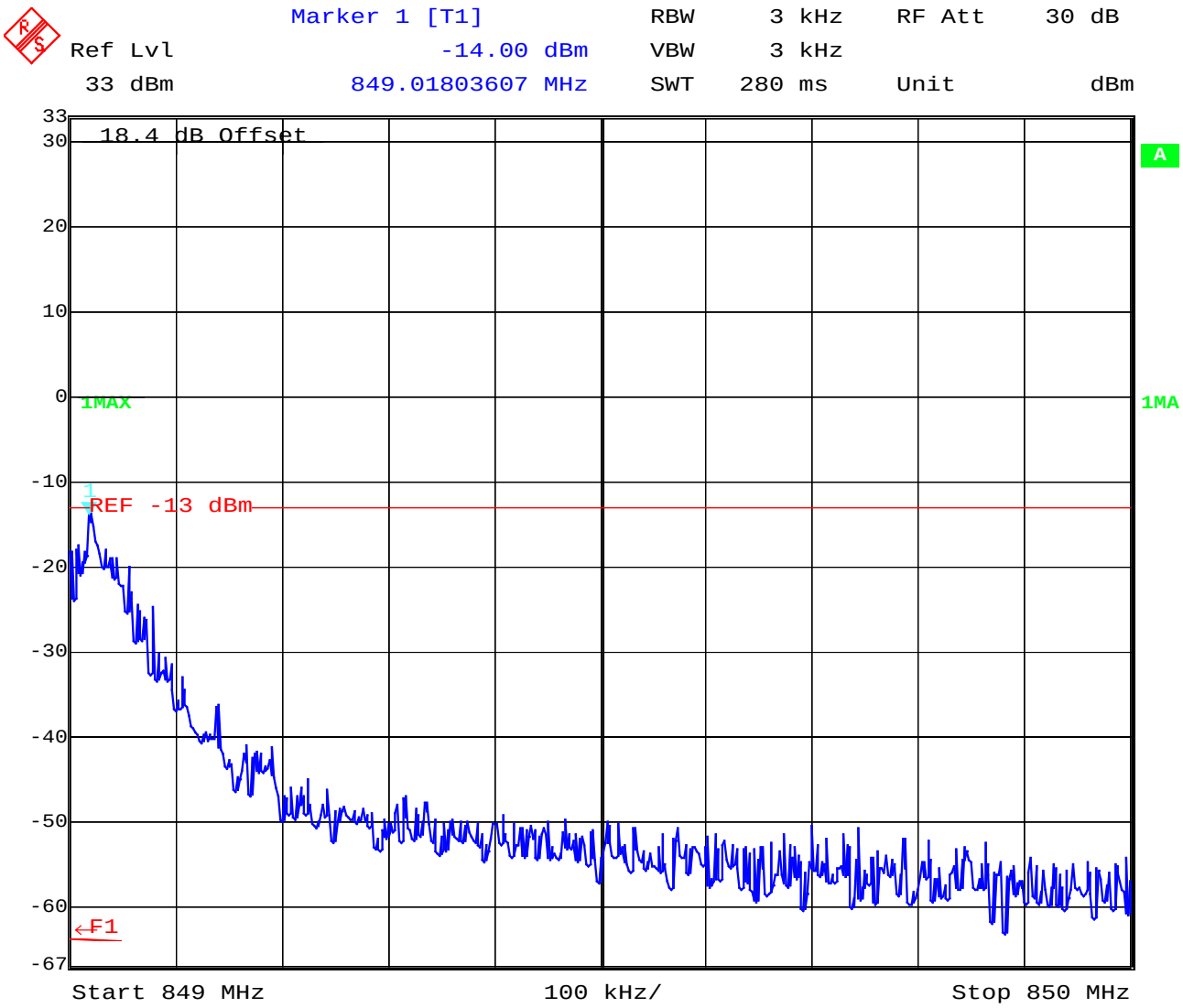
**Measurement Limit:**
Sec. 22.917(b) Emission Limits.
(a) On any frequency outside frequency band of the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels +33 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

**Measurements:**
**Block 1 Channel 128**




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

**Block 4 Channel 251**




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## OCCUPIED BANDWIDTH §2.989

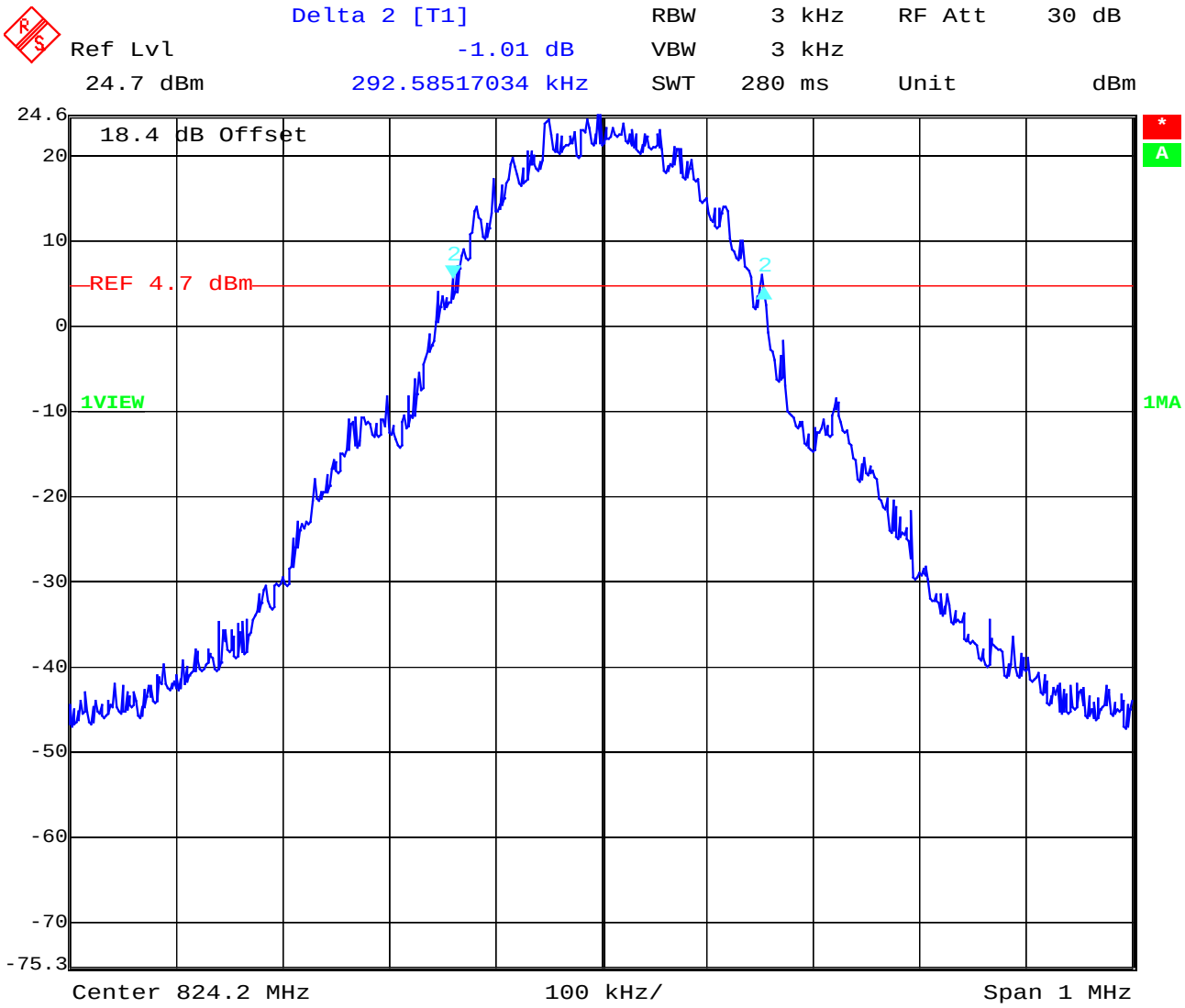
**Occupied Bandwidth Results**

Similar to conducted emissions, occupied bandwidth measurements are only provided for selected frequencies in order to reduce the amount of submitted data. Data were taken at the extreme and mid frequencies of the USPCS frequency band. Table 8.2 below lists the measured 99% power and -26dBC occupied bandwidths. Spectrum analyzer plots are included on the following pages.

| Frequency | 99% Occupied Bandwidth | -26 dBc Bandwidth |
|---|---|---|
| 824.2 MHz | 292.585 | 332.665 |
| 836.4 MHz | 294.589 | 322.645 |
| 848.8 MHz | 292.585 | 320.641 |

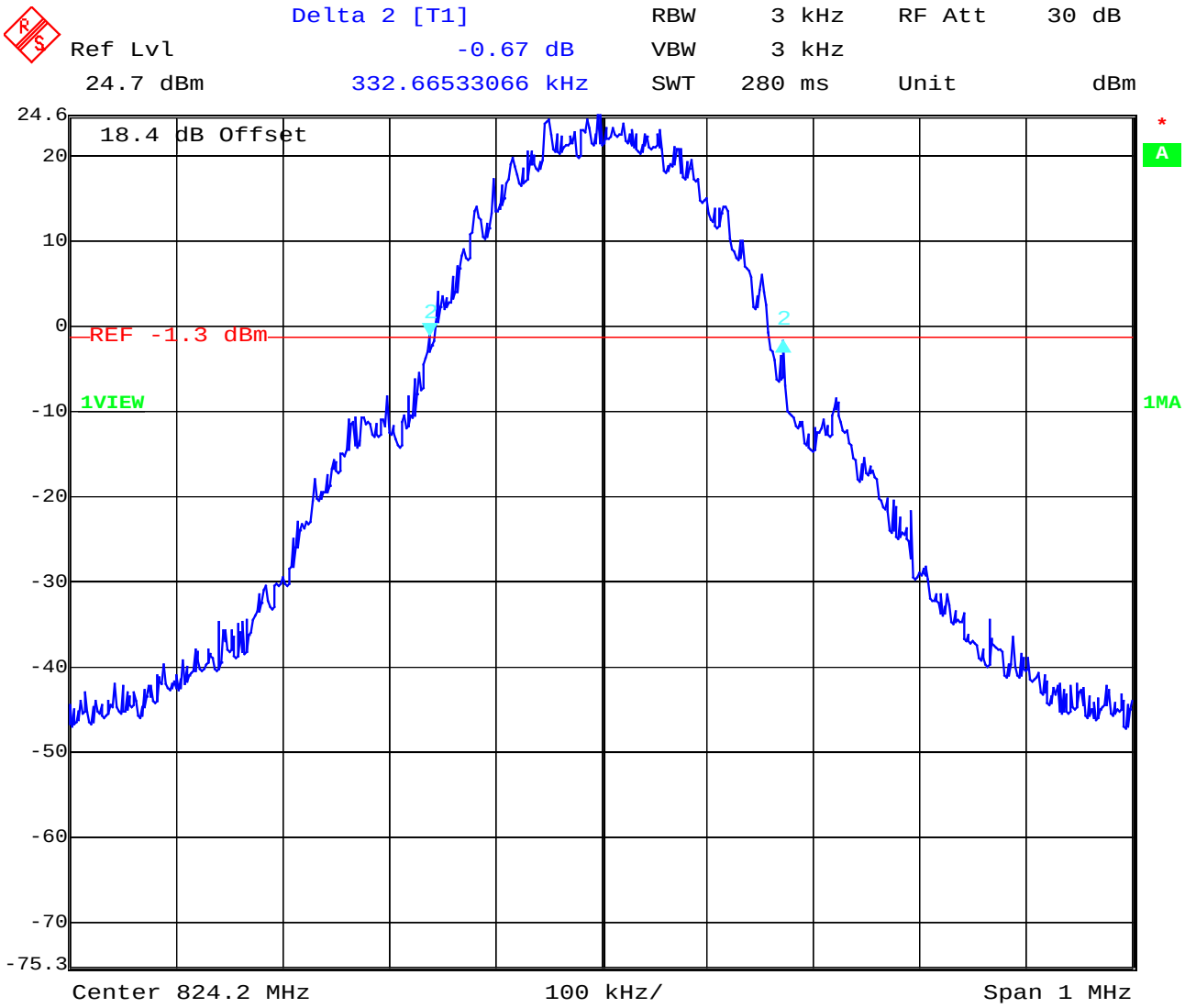
Part 24.238 (a) requires a measurement bandwidth of at least 1% of the occupied bandwidth. For ca. 279 kHz, this equates to a resolution bandwidth of at least 2.8 kHz. For this testing, a resolution bandwidth 3.0 kHz was used.

**Channel 128**
**99% Occupied Bandwidth**



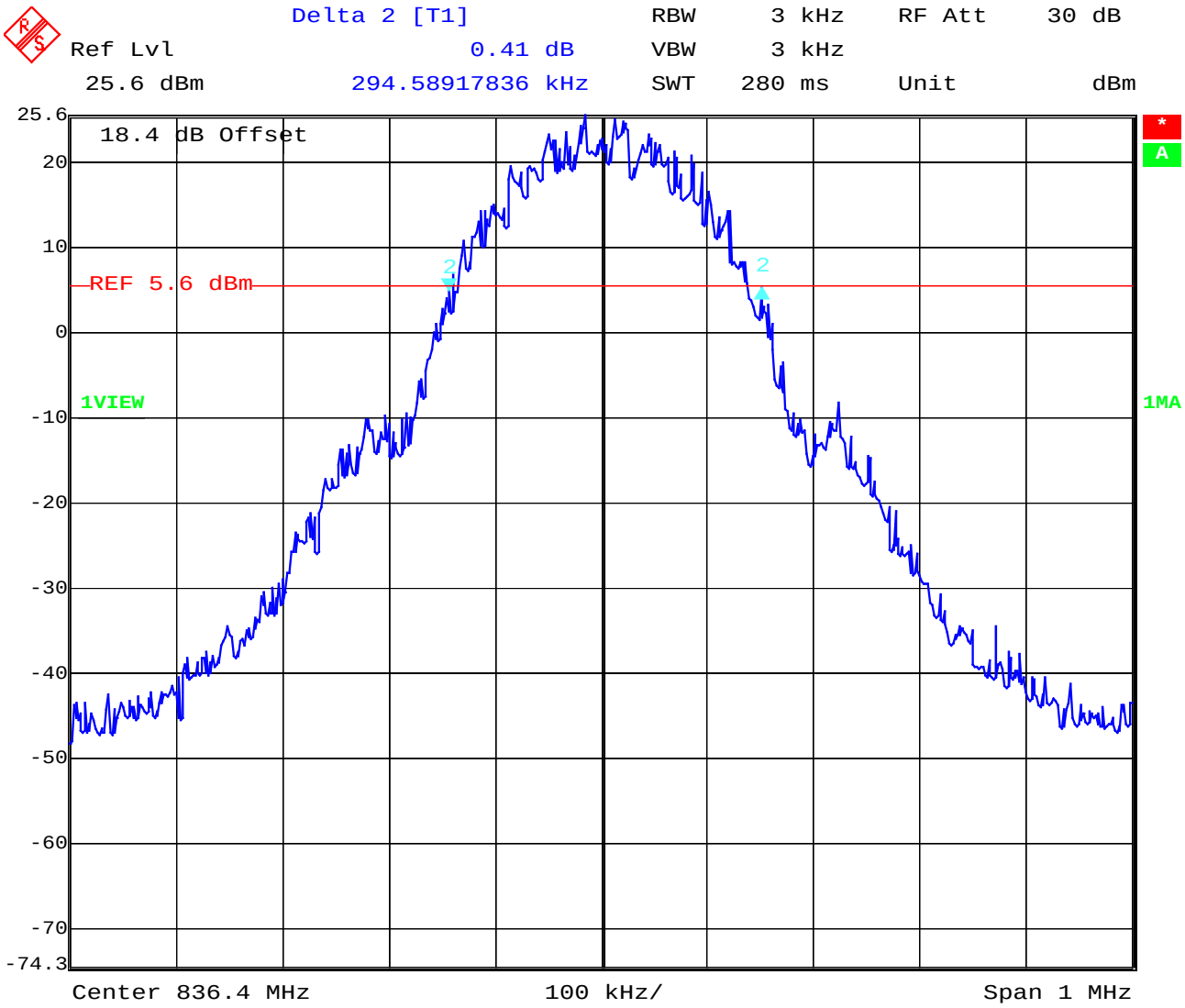

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

**Channel 128**
**-26 dBc Bandwidth**



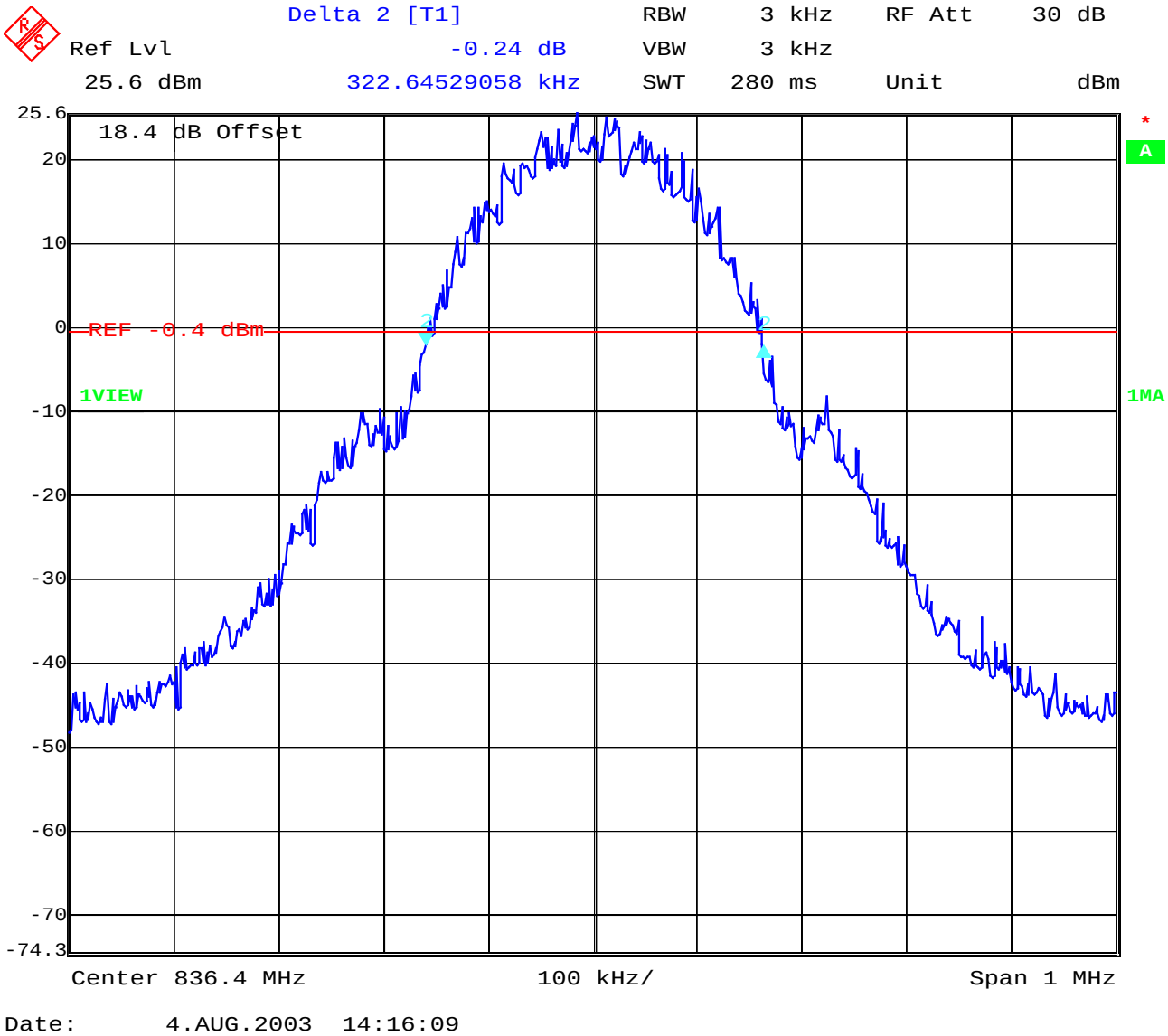

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

**Channel 189**
**99% Occupied Bandwidth**



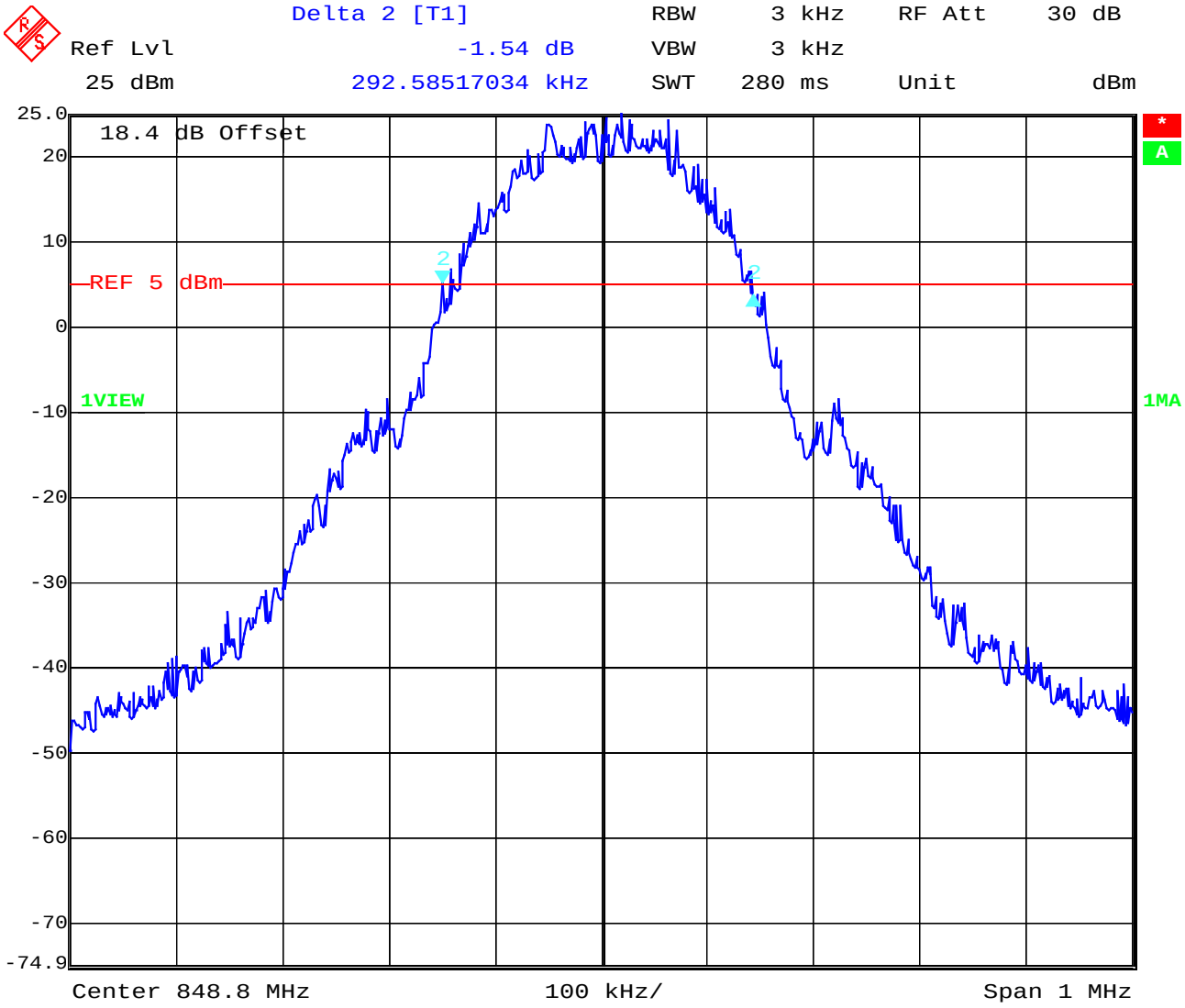

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

**Channel 189**
**-26 dBc Bandwidth**



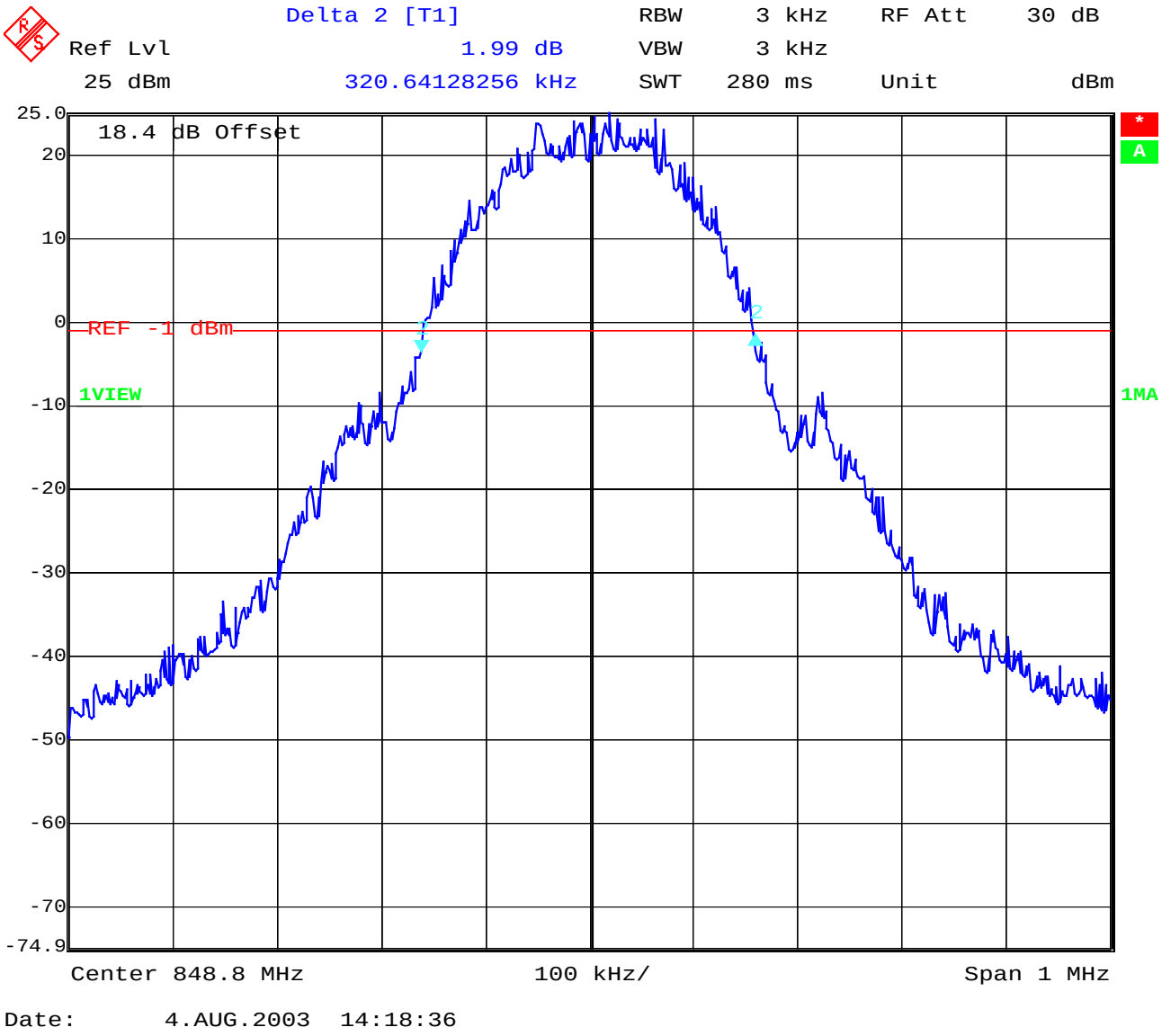

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

**Channel 251**
**99% Occupied Bandwidth**




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

**Channel 251**
**-26 dBc Bandwidth**



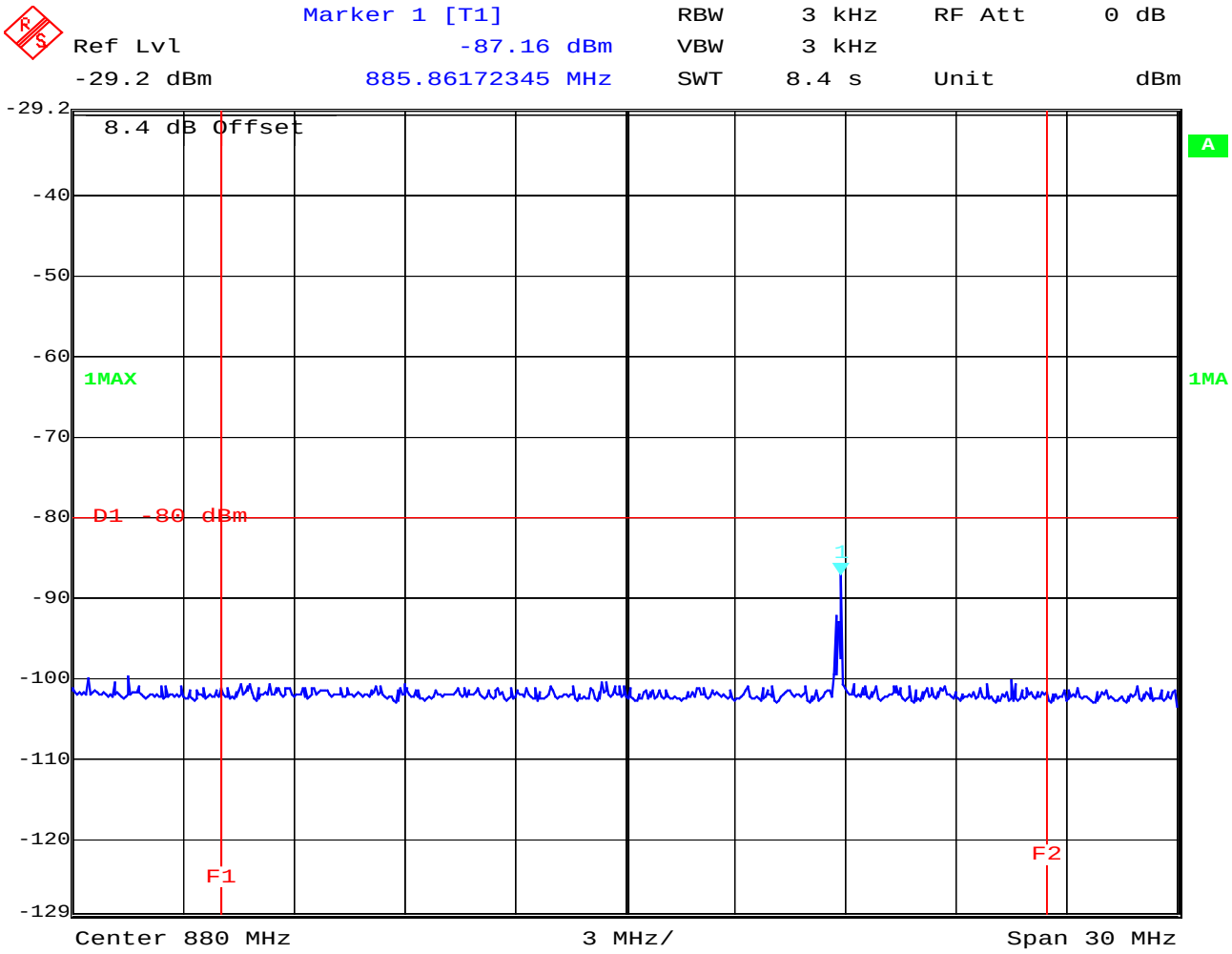

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

## EMISSION LIMITATIONS FOR CELLULAR §22.917(F)

### Mobile emissions in the base frequency range

**All peaks are below –80 dBm in the base frequency range.**

### Idle Mode base station frequency range A




**F1 = 869 MHz, F2 = 891.5 MHz**

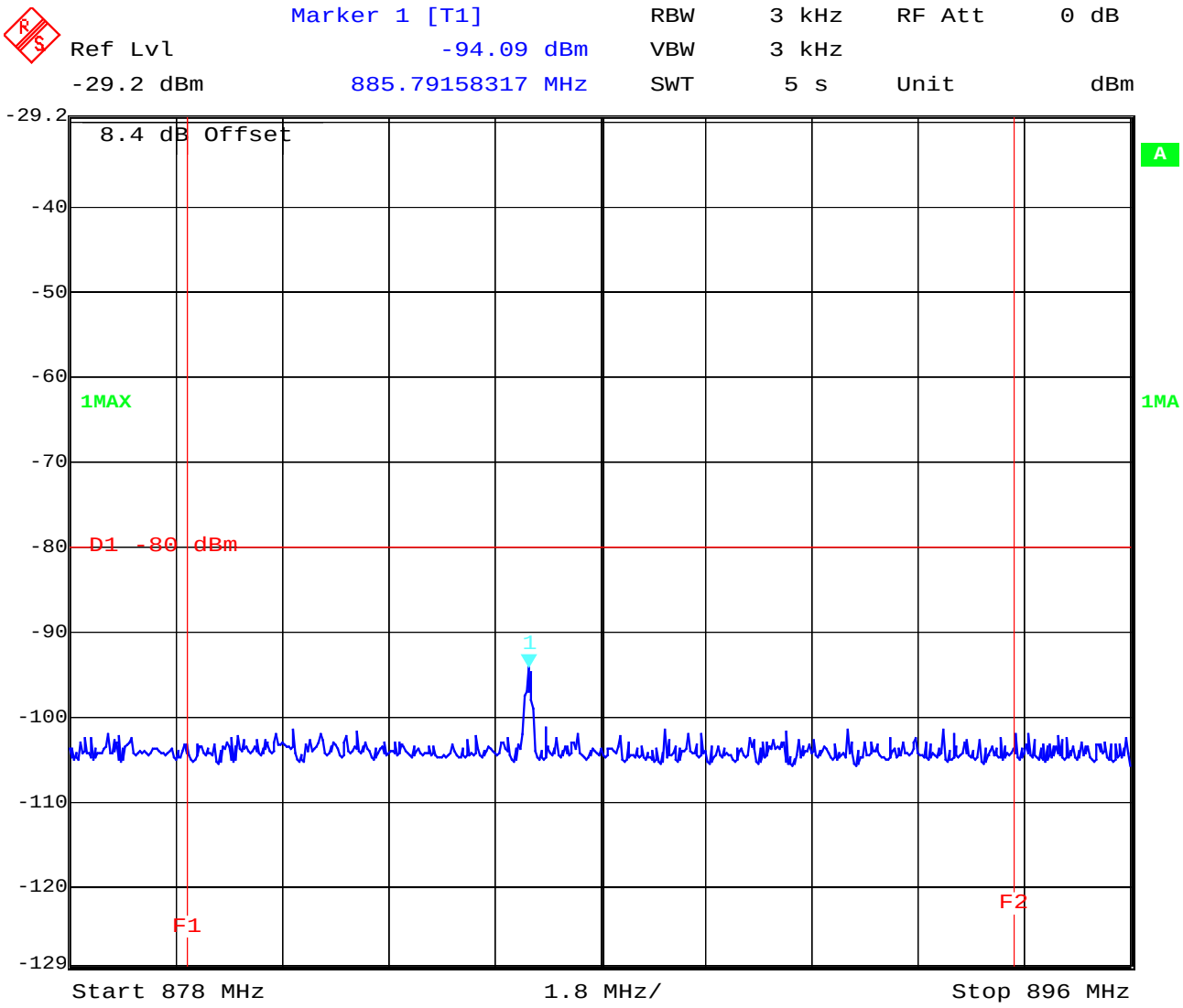
**LIMITS §22.917(f)**

| |
|---|
| **The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not to exceed –80dBm at the transmitter antenna connector** |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

Mobile emissions in the base frequency range

**Idle Mode base station frequency range B**




**F1 = 880 MHz, F2 = 894 MHz**

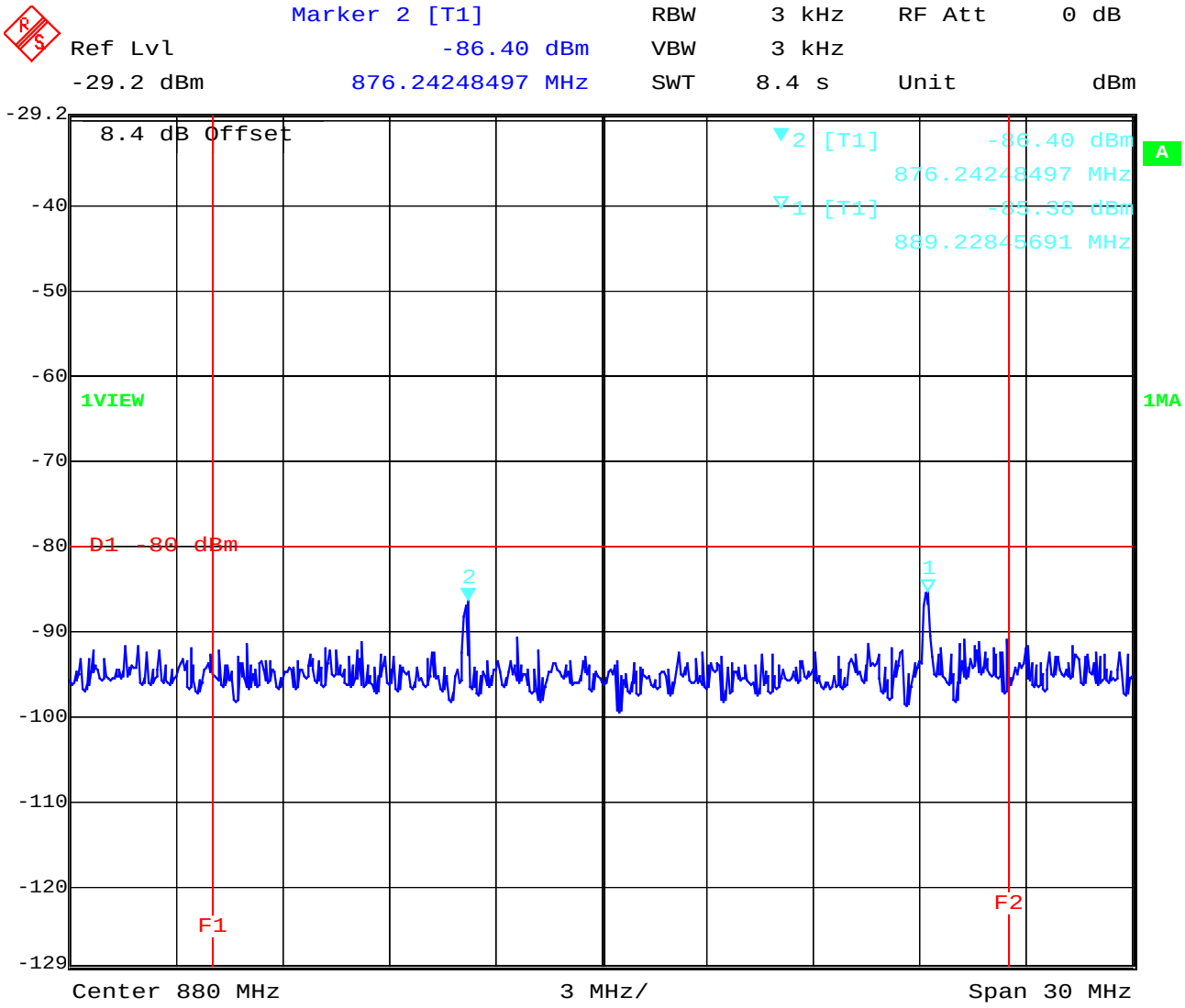
**LIMITS** **§22.917(f)**

| **The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not to exceed –80dBm at the transmitter antenna connector** |
|---|

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

Mobile emissions in the base frequency range

**TX Mode CH 128 base station frequency range A**




**F1 = 869 MHz, F2 = 891.5 MHz**

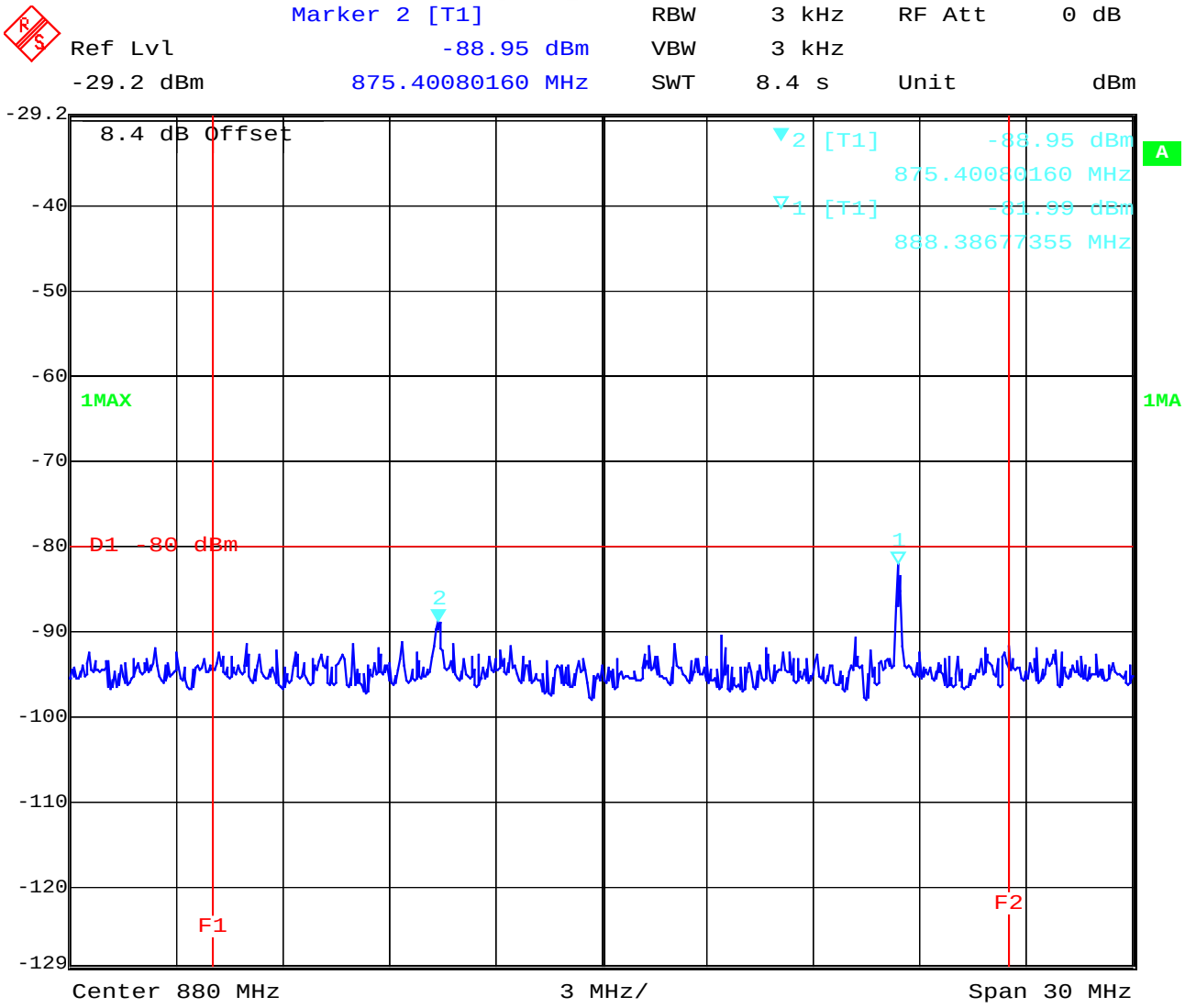
**LIMITS §22.917(f)**

| |
|---|
| **The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not to exceed –80dBm at the transmitter antenna connector** |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

Mobile emissions in the base frequency range

**TX Mode CH 189 base station frequency range A**




Date: 4.AUG.2003 14:58:35

**F1 = 869 MHz, F2 = 891.5 MHz**

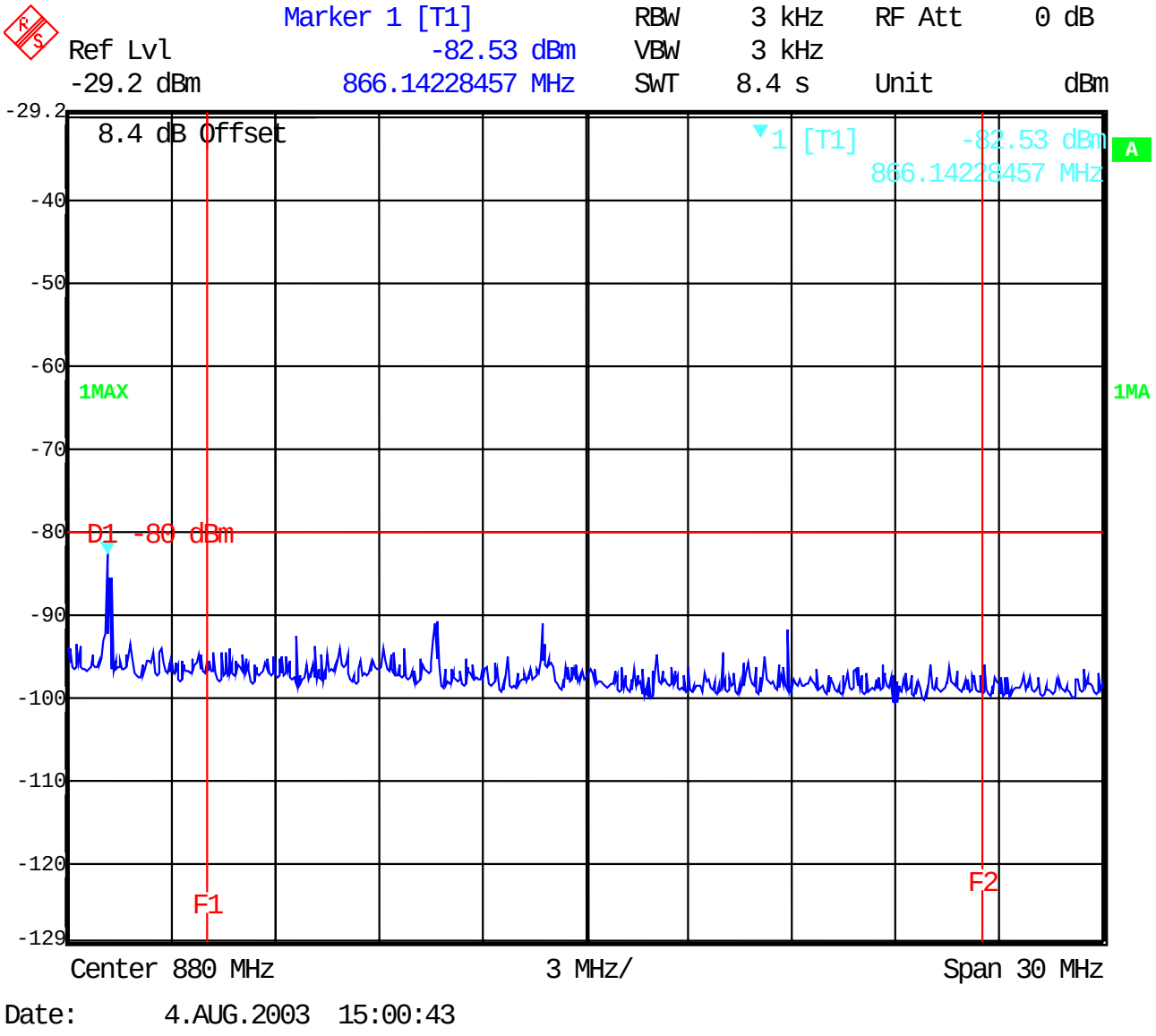
**LIMITS** **§22.917(f)**

| |
|---|
| **The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not to exceed –80dBm at the transmitter antenna connector** |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

Mobile emissions in the base frequency range

**TX Mode CH 251 base station frequency range A**




**F1 = 869 MHz, F2 = 891.5 MHz**

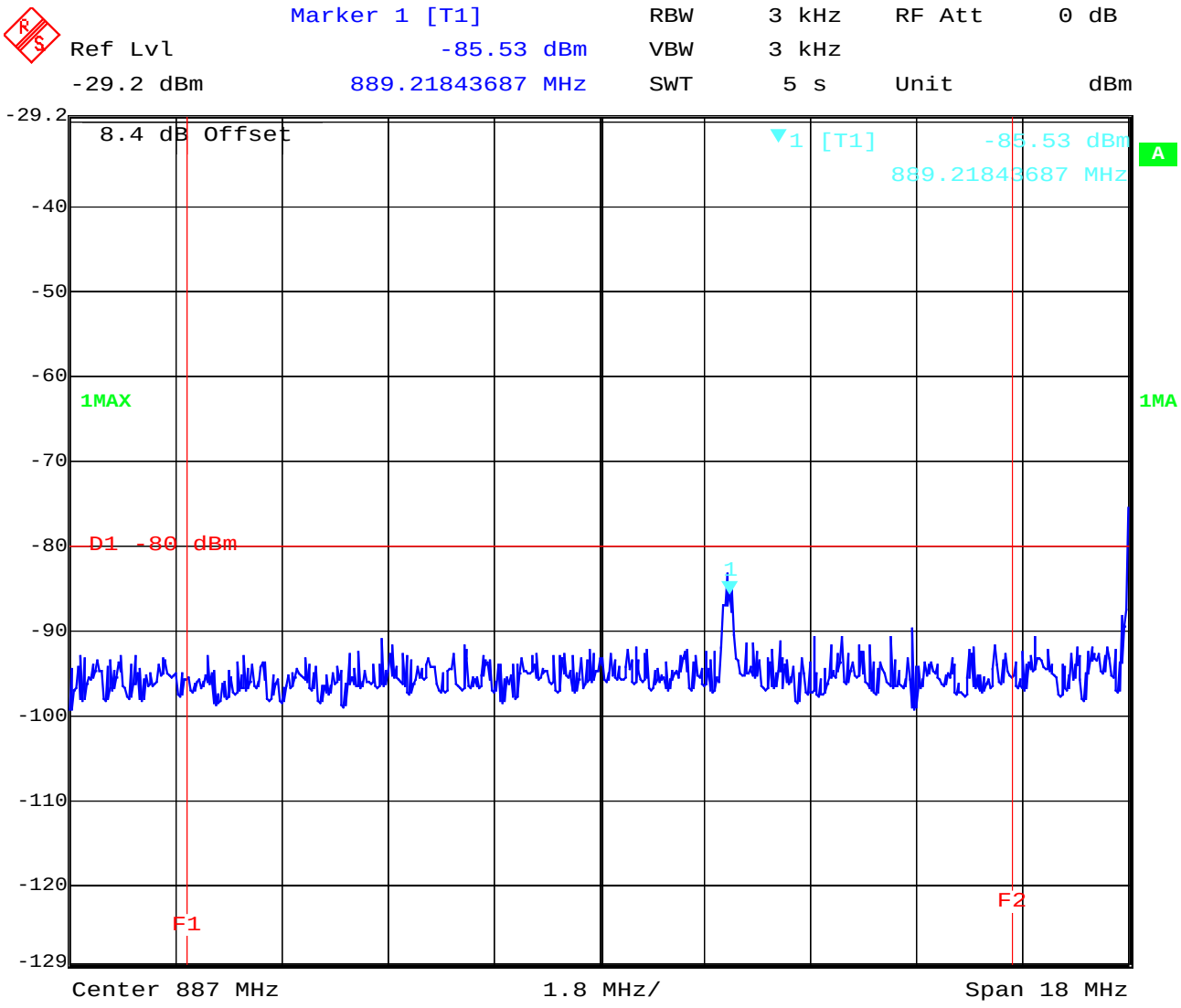
**LIMITS** **§22.917(f)**

| |
|---|
| **The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not to exceed –80dBm at the transmitter antenna connector** |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

Mobile emissions in the base frequency range

**TX Mode CH 128 base station frequency range B**




**F1 = 880 MHz, F2 = 894 MHz**

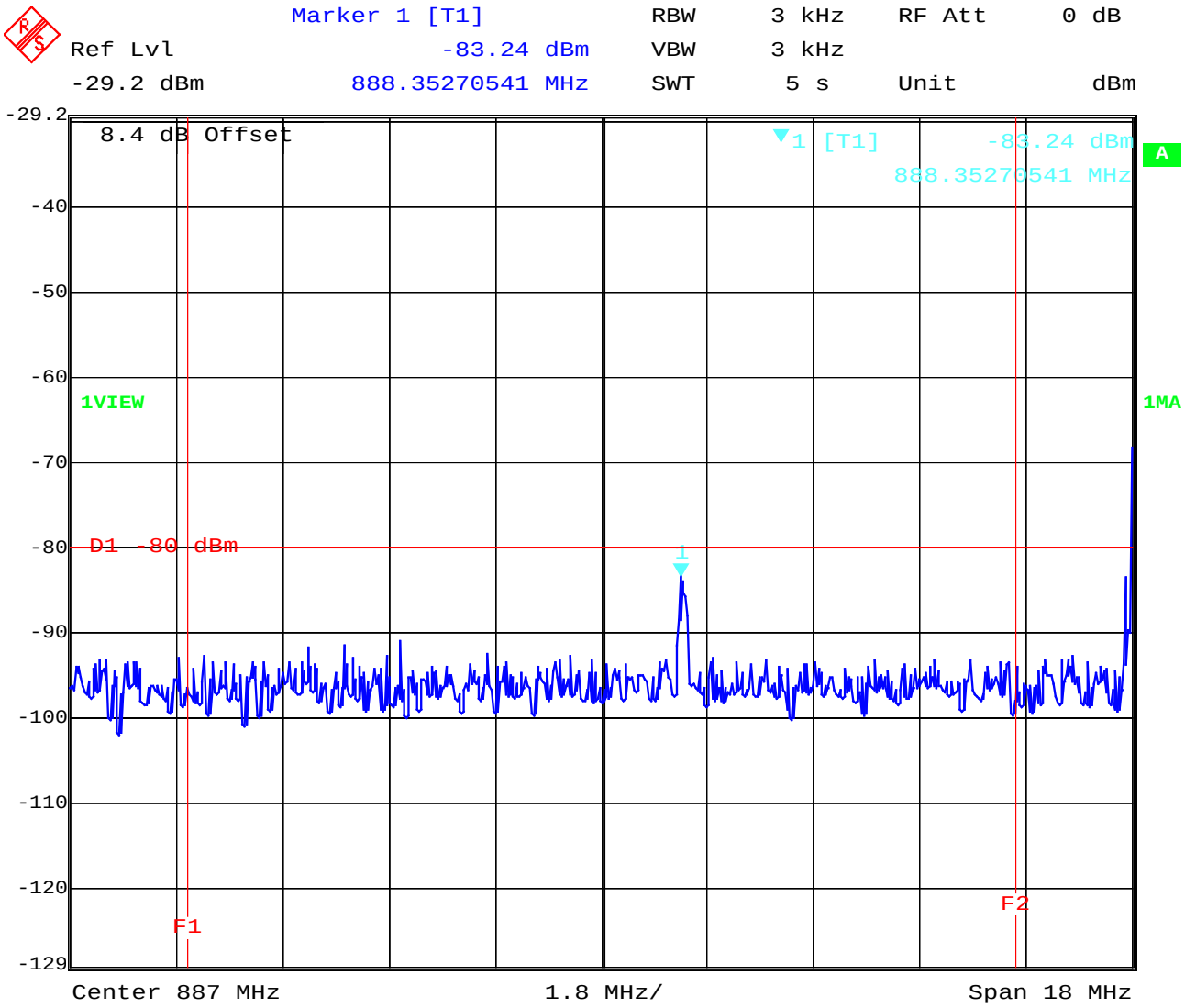
**LIMITS** **§22.917(f)**

| |
|---|
| **The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not to exceed –80dBm at the transmitter antenna connector** |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

Mobile emissions in the base frequency range

### TX Mode CH 189 base station frequency range B




**F1 = 880 MHz, F2 = 894 MHz**

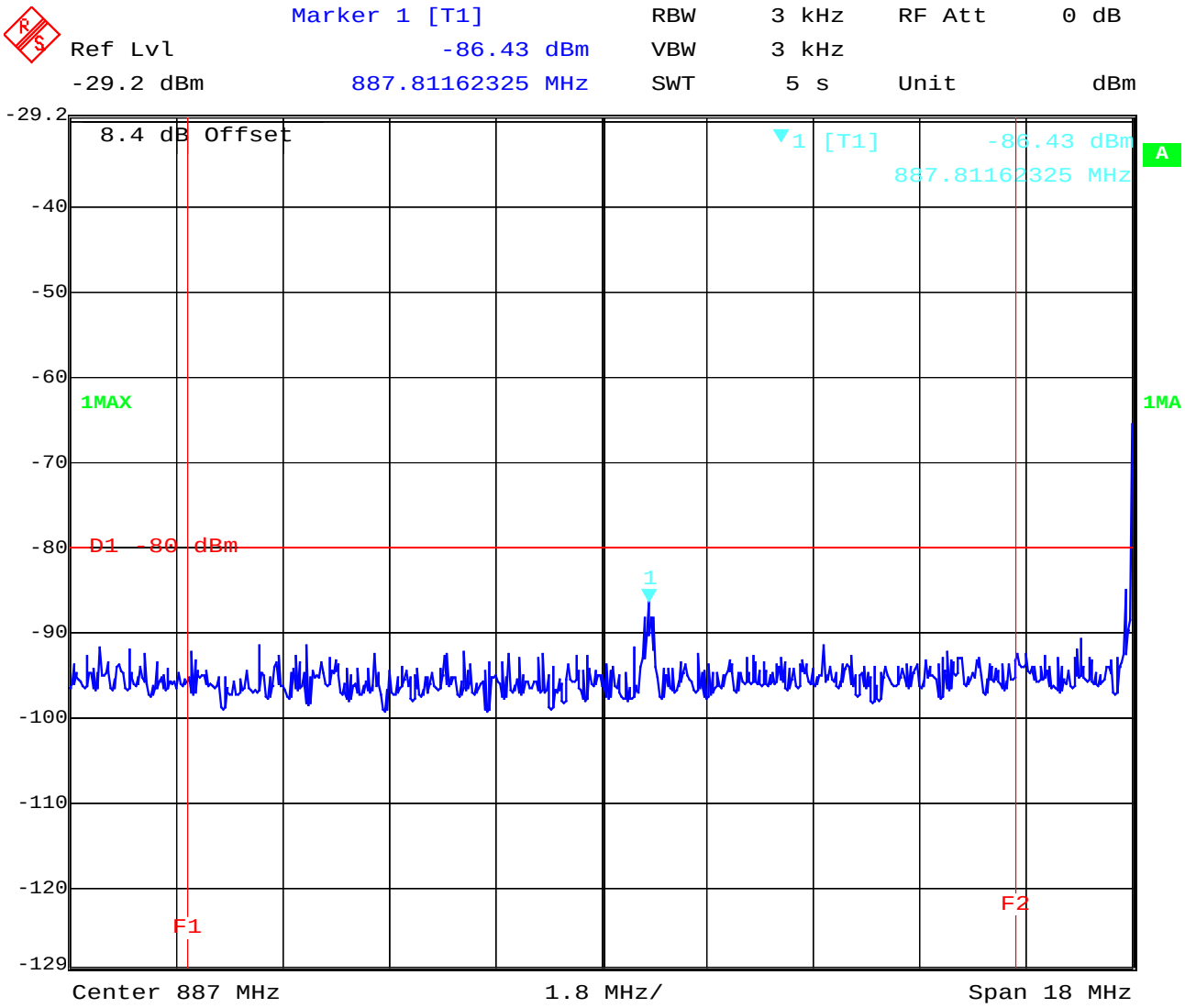
**LIMITS** **§22.917(f)**

| |
|---|
| **The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not to exceed –80dBm at the transmitter antenna connector** |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

Mobile emissions in the base frequency range

**TX Mode CH 251 base station frequency range B**




**F1 = 880 MHz, F2 = 894 MHz**

**LIMITS §22.917(f)**

| |
|---|
| **The mean power of any emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not to exceed –80dBm at the transmitter antenna connector** |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**64**

## ADDITIONAL MEASUREMENTS FOR ANCILLARY EQUIPMENT PART 15.109

**The radiated measurements are performed in vertical and horizontal plane in the frequency range from 9 kHz to 20 GHz in semi-anechoic chambers. The EUT is positioned on a non-conductive support with a height of 0.80 m above a conductive ground plane that covers the whole chamber.**
**The receiving antennas are conform with specifications ANSI C63.2-1987 clause 15 and ANSI C63.4-1992 clause 4.1.5. These antennas can be moved over the height range between 1.0 m and 4.0 m in order to search for maximum field strength emitted from EUT. The measurement distances between EUT and receiving antennas are indicated in the test setups for the various frequency ranges. For each measurement, the EUT is rotated in all three axes until the maximum field strength is received.**
**The wanted and unwanted emissions are received by spectrum analyzers where the detector modes and resolution bandwidths over various frequency ranges are set according to requirement ANSI C63-4-1992 clause 4.2.**

**Antennas are conform with ANSI C63.2-1996 item 15.**

**9 kHz - 30 MHz: Quasi Peak measurement, 9kHz Bandwidth, passive loop antenna.**

**30 MHz - 200 MHz: Quasi Peak measurement, 120KHz Bandwidth, biconical antenna**

**200MHz - 1GHz: Quasi Peak measurement, 120KHz Bandwidth, log periodic antenna**

**1GHz: Average, RBW 1MHz, VBW 10 Hz, wave-guide horn**

**Ancillary equipment** :

- AC adapter TA3651-US
- AC adapter 18805593-9
- AC adapter DTC3515 045E040E
- Head-set 23812517-0
- Car kit A17-BA10-010
- Data cable 23810787-0
- Cigar lighter adapter 23811253-7

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

**Spurious Emissions**

| SPURIOUS EMISSIONS LEVEL (µV/m) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CH 189 | | | CH 661 | | | Idle mode(850/1900) | | |
| f (MHz) | Detector | Level (µV/m) | f (MHz) | Detector | Level (µV/m) | f (MHz) | Detector | Level (µV/m) |
| | | | | | | | | |
| no traceable peak found | | | no traceable peak found | | | no traceable peak found | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Measurement uncertainty | | | ±3 dB | | | | | |

**f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW: 1 MHz**

**Measurement distance see table**

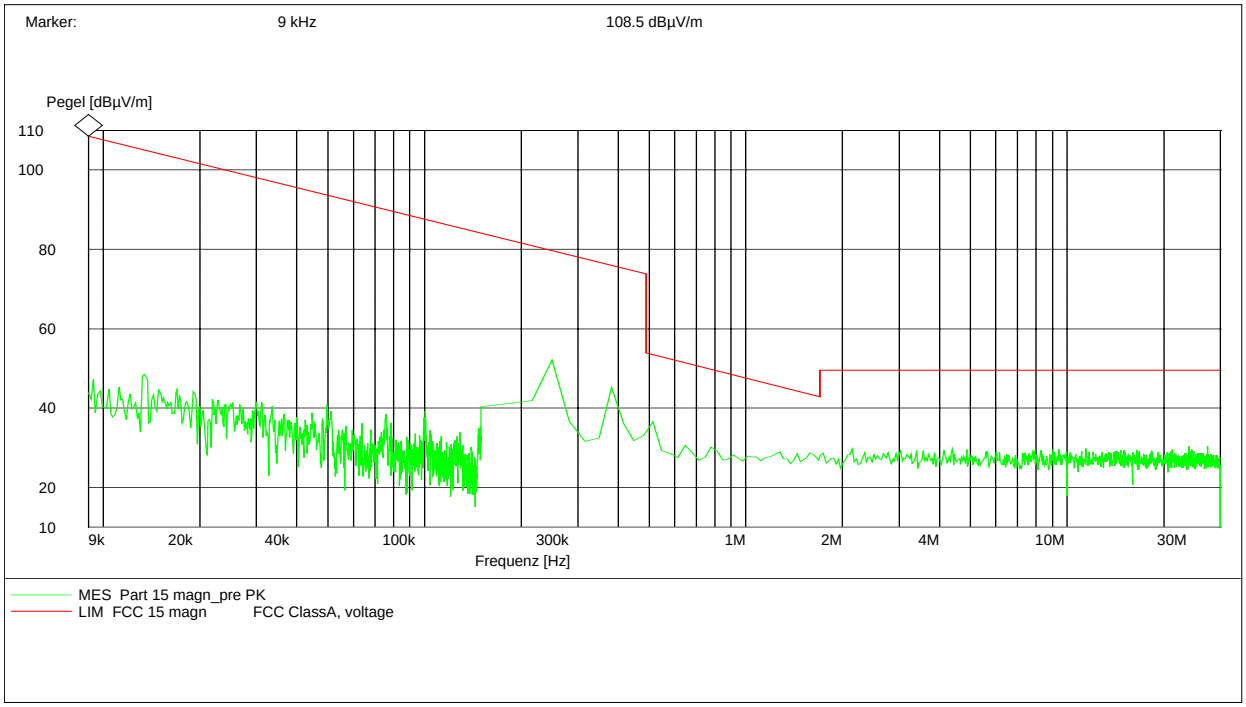
**Limits SUBCLAUSE § 15.109**

| Frequency (MHz) | Field strength (µV/m) | Measurement distance (m) |
|---|---|---|
| 0.009 – 0.490 | 2400/F(kHz) | 300 |
| 0.490 – 1.705 | 24000/F(kHz) | 30 |
| 1.705 – 30.0 | 30 / 29.5 dBµV/m | 30 |
| 30 - 88 | 100 / 40 dBµV/m | 3 |
| 88 - 216 | 150 / 43.5 dBµV/m | 3 |
| 216 - 960 | 200 / 46 dBµV/m | 3 |
| above 960 | 500 / 54 dBµV/m | 3 |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## Part 15 Magnetics (Valid for PCS 850 and PCS1900)

EUT: Mobile phone 2003a
Manufacturer: Sagem
Operating Condition: Charger TA3651-US
Test Specification: 110V / 60 Hz, traffic and idle mode
Comment: pass




**Limits** **SUBCLAUSE § 15.109**

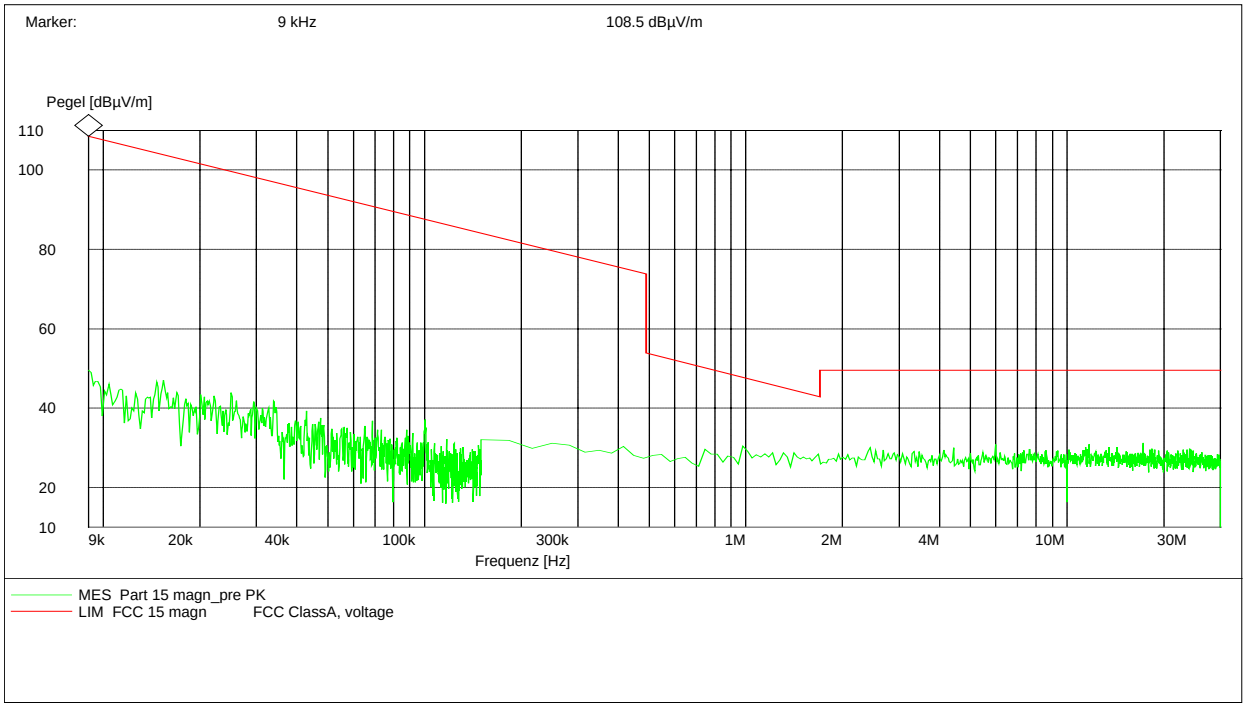
| Frequency (MHz) | Field strength (µV/m) | Measurement distance (m) |
|---|---|---|
| 0.009 – 0.490 | 2400/F(kHz) | 300 |
| 0.490 – 1.705 | 24000/F(kHz) | 30 |
| 1.705 – 30.0 | 30 / 29.5 dBµV/m | 30 |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

**FCC Rule 47**

**Part 15 Magnetics (Valid for PCS 850 and PCS1900)**

EUT: Mobile phone 2003a
Manufacturer: Sagem
Operating Condition: Charger 18805593-9
Test Specification: traffic and idle mode
Comment: pass




**Limits** **SUBCLAUSE § 15.109**

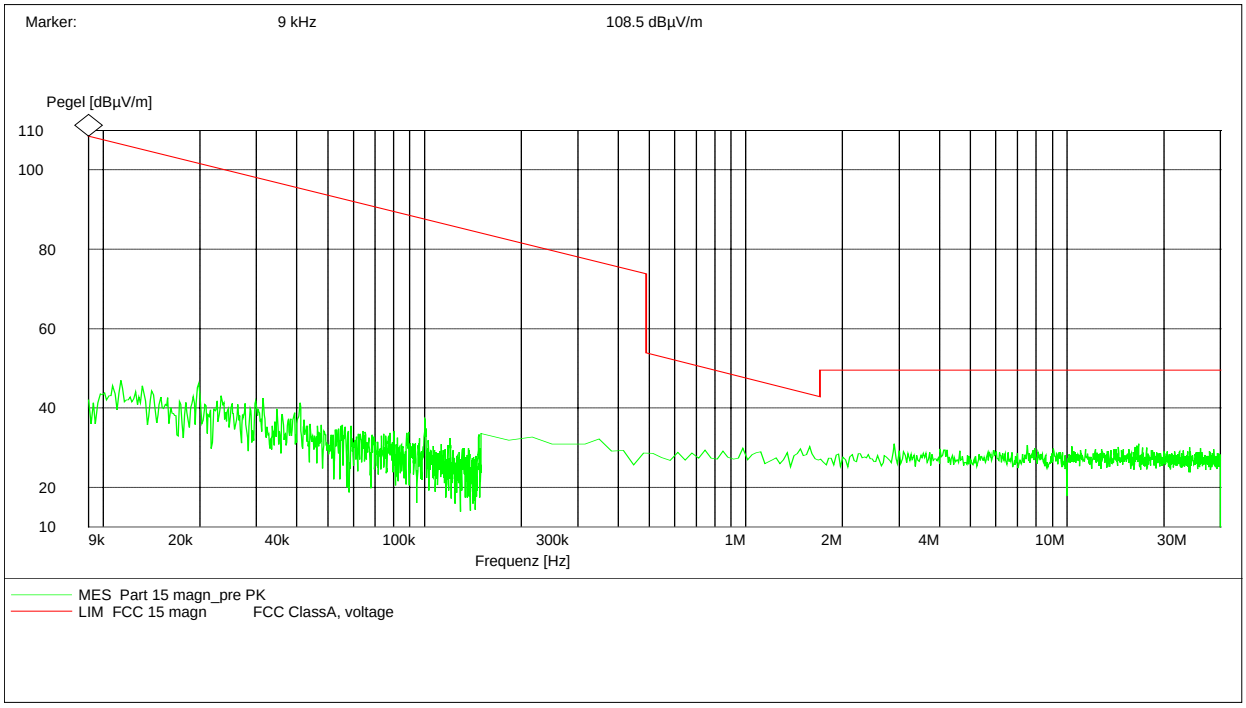
| Frequency (MHz) | Field strength (µV/m) | Measurement distance (m) |
|---|---|---|
| 0.009 – 0.490 | 2400/F(kHz) | 300 |
| 0.490 – 1.705 | 24000/F(kHz) | 30 |
| 1.705 – 30.0 | 30 / 29.5 dBµV/m | 30 |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

FCC Rule 47

**Part 15 Magnetics (Valid for PCS 850 and PCS1900)**

EUT: Mobile phone 2003a
Manufacturer: Sagem
Operating Condition: Charger DTC3515 045E040E
Test Specification: traffic and idle mode
Comment: pass




**Limits** **SUBCLAUSE § 15.109**

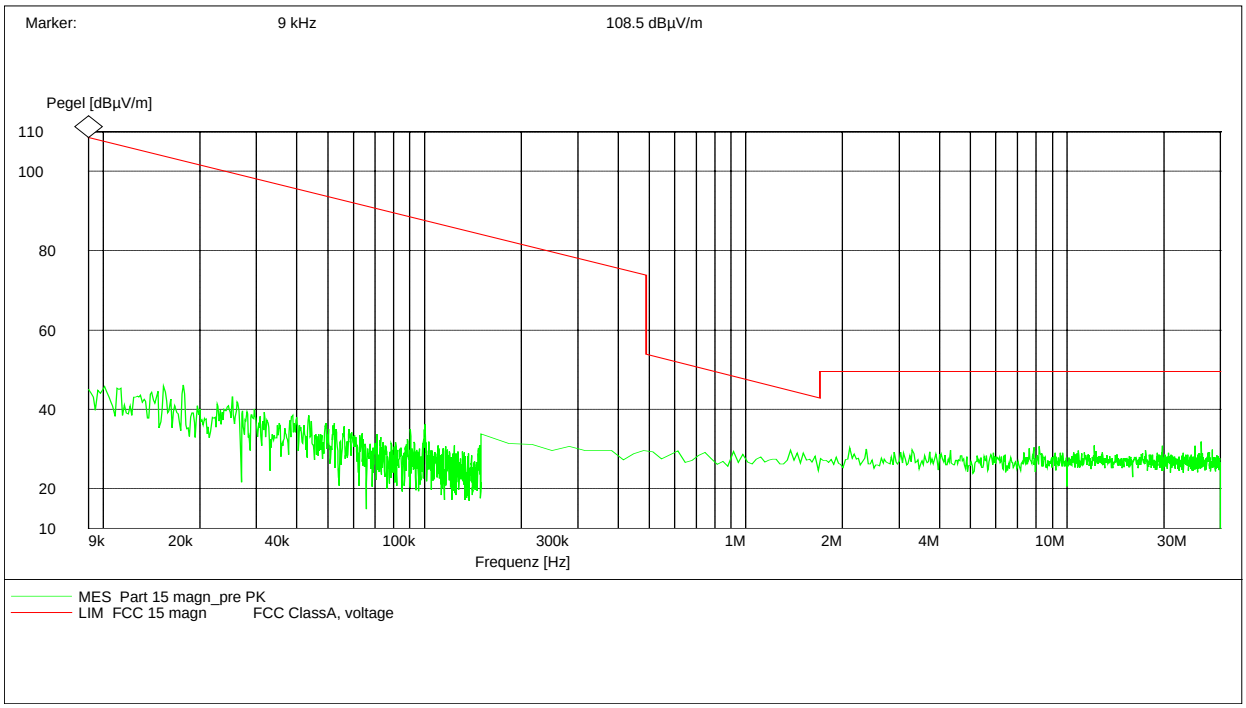
| Frequency (MHz) | Field strength (µV/m) | Measurement distance (m) |
|---|---|---|
| 0.009 – 0.490 | 2400/F(kHz) | 300 |
| 0.490 – 1.705 | 24000/F(kHz) | 30 |
| 1.705 – 30.0 | 30 / 29.5 dBµV/m | 30 |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

**FCC Rule 47**

**Part 15 Magnetics (Valid for PCS 850 and PCS1900)**

EUT: Mobile phone 2003a
Manufacturer: Sagem
Operating Condition: with car kit A17-BA10-10
Test Specification: traffic and idle mode
Comment: pass




**Limits** **SUBCLAUSE § 15.109**

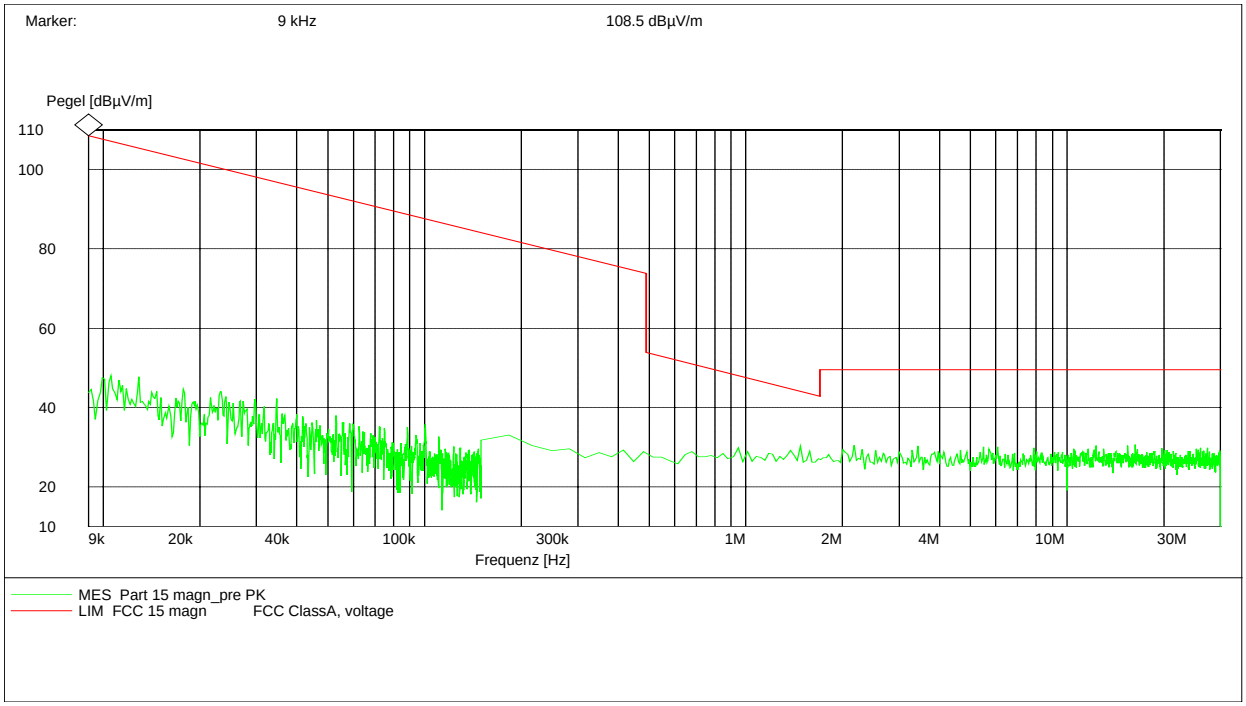
| Frequency (MHz) | Field strength (µV/m) | Measurement distance (m) |
|---|---|---|
| 0.009 – 0.490 | 2400/F(kHz) | 300 |
| 0.490 – 1.705 | 24000/F(kHz) | 30 |
| 1.705 – 30.0 | 30 / 29.5 dBµV/m | 30 |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

**FCC Rule 47**

**Part 15 Magnetics (Valid for PCS 850 and PCS1900)**

EUT: Mobile phone 2003a
Manufacturer: Sagem
Operating Condition: with cigar lighter adapter 23811253-7 and data cable 23810787-0
Test Specification: traffic and idle mode
Comment: pass




**Limits** **SUBCLAUSE § 15.109**

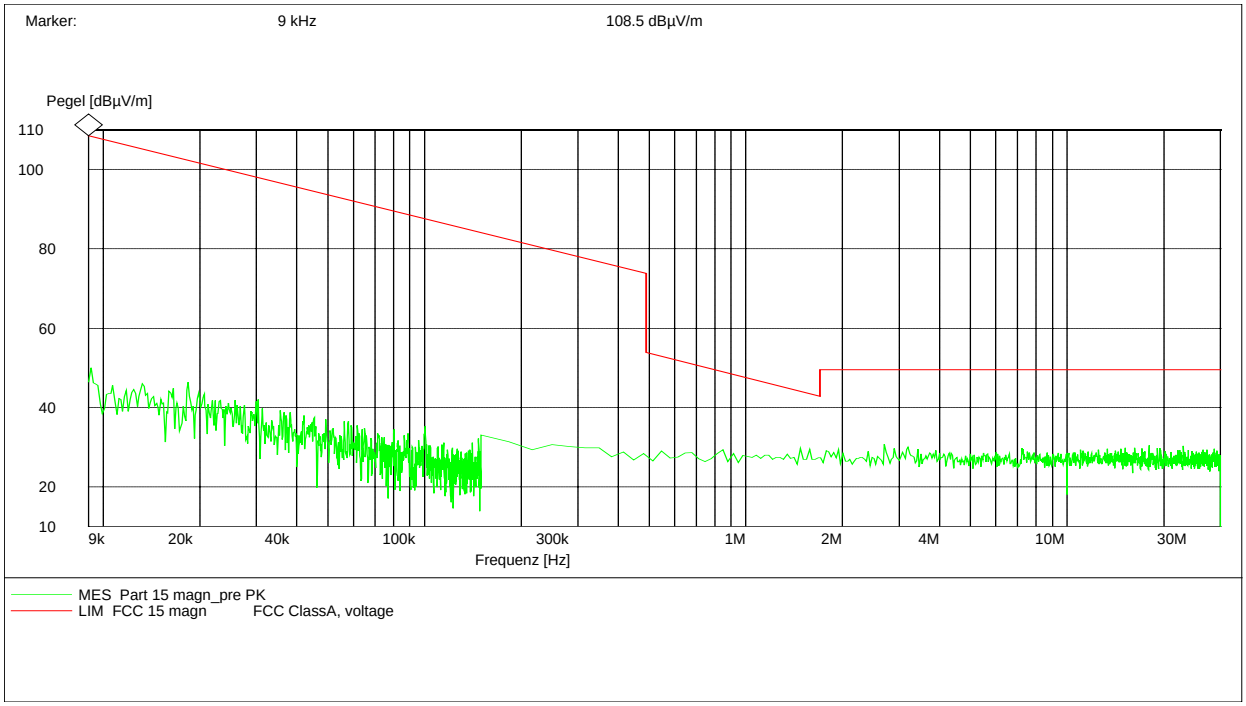
| Frequency (MHz) | Field strength (µV/m) | Measurement distance (m) |
|---|---|---|
| 0.009 – 0.490 | 2400/F(kHz) | 300 |
| 0.490 – 1.705 | 24000/F(kHz) | 30 |
| 1.705 – 30.0 | 30 / 29.5 dBµV/m | 30 |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

**FCC Rule 47**

**Part 15 Magnetics (Valid for PCS 850 and PCS1900)**

EUT: Mobile phone 2003a
Manufacturer: Sagem
Operating Condition: with headset 23812517-0
Test Specification: traffic and idle mode
Comment: pass



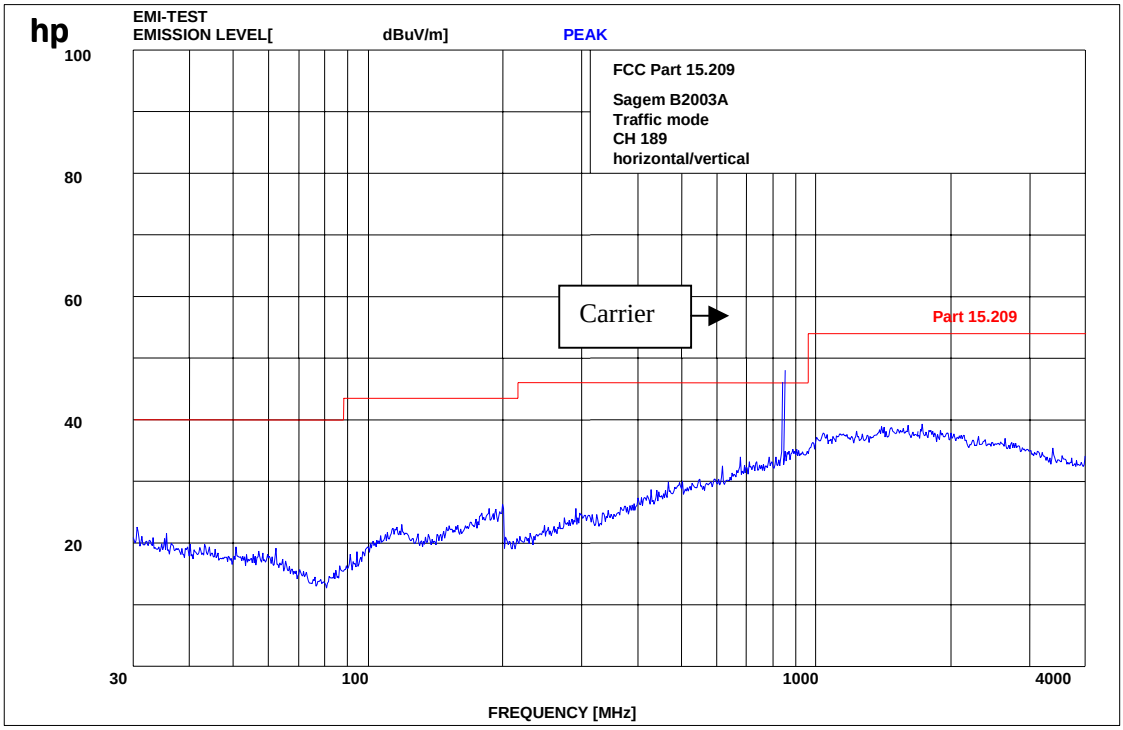

**Limits** **SUBCLAUSE § 15.109**

| Frequency (MHz) | Field strength (µV/m) | Measurement distance (m) |
|---|---|---|
| 0.009 – 0.490 | 2400/F(kHz) | 300 |
| 0.490 – 1.705 | 24000/F(kHz) | 30 |
| 1.705 – 30.0 | 30 / 29.5 dBµV/m | 30 |

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

**SPURIOUS RADIATION § 15.109**

**CH 189 up to 4 GHz, valid for all accessories, no difference in behavior**



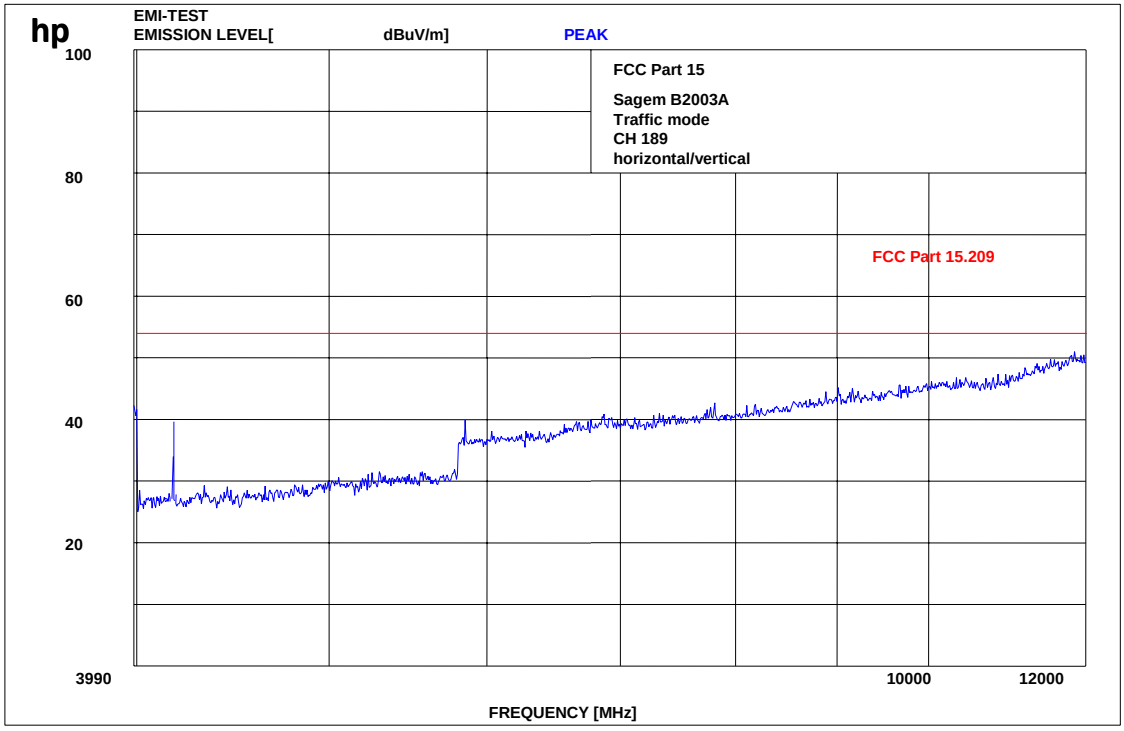

**f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW 1 MHz**

**Carrier suppressed with a rejection filter**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## SPURIOUS RADIATION § 15.109

**CH 189 up to 12 GHz, valid for all accessories, no difference in behavior**



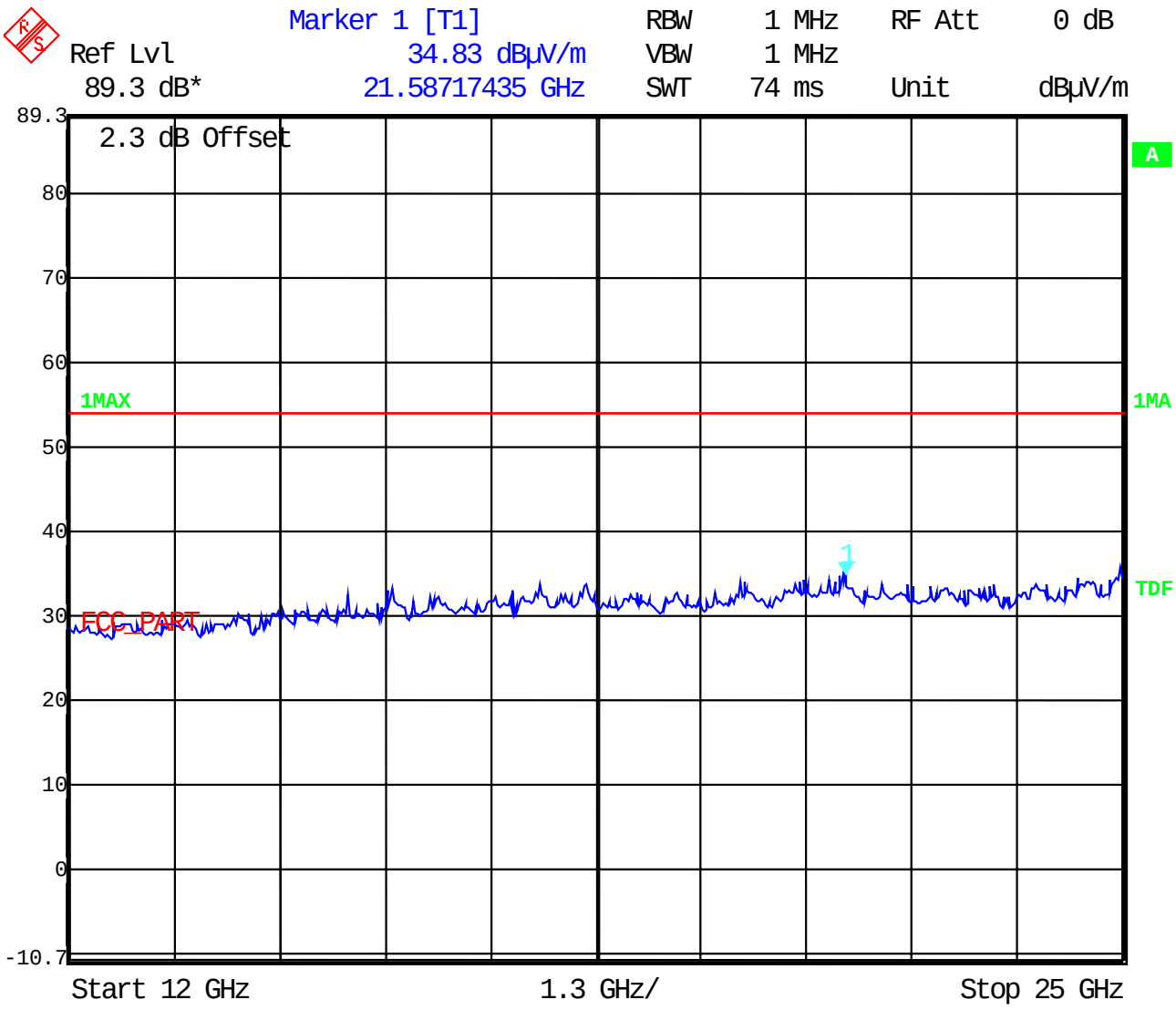

**f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW 1 MHz**

**Carrier suppressed with a rejection filter**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

**SPURIOUS RADIATION § 15.109**

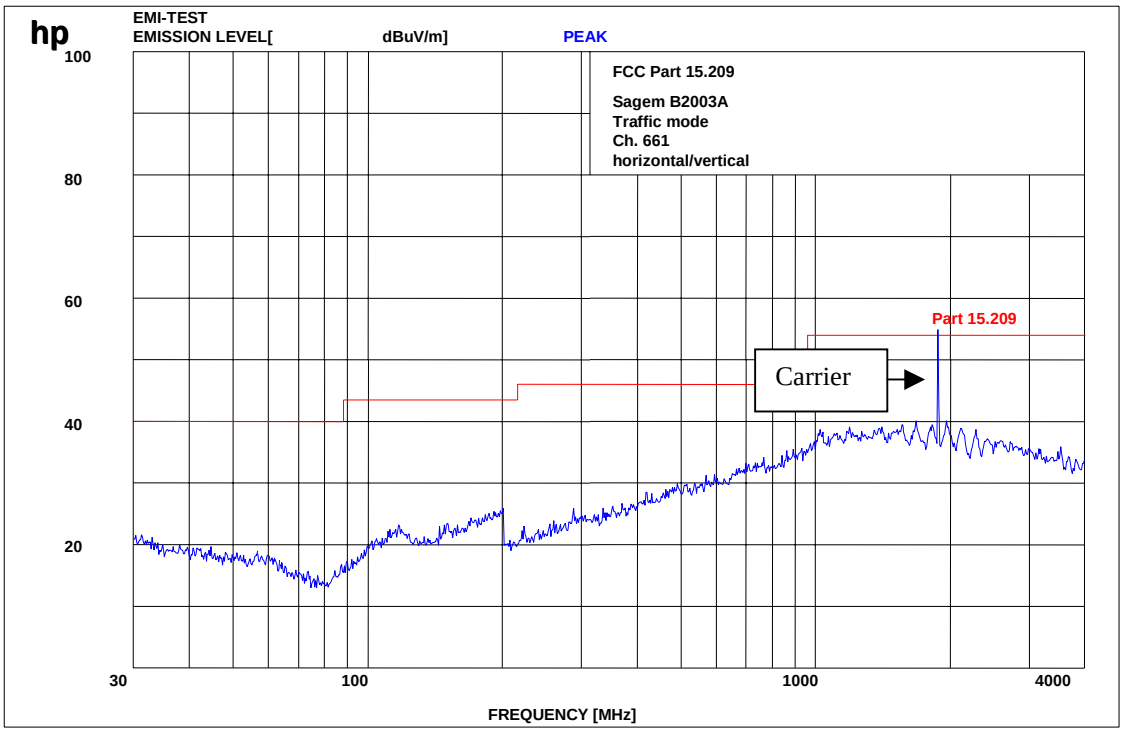
**CH 189 up to 25 GHz, valid for all accessories, no difference in behavior**




**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## SPURIOUS RADIATION § 15.109

**CH 661 up to 4 GHz, valid for all accessories, no difference in behavior**



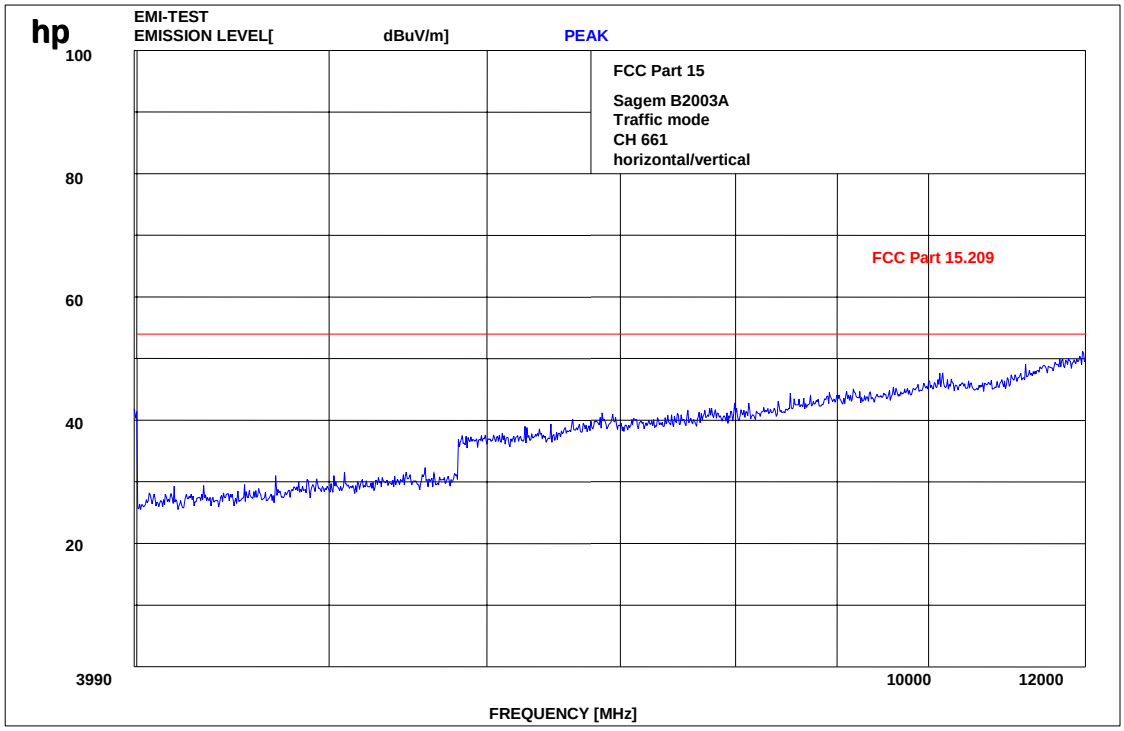

**f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW 1 MHz**

**Carrier suppressed with a rejection filter**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

## SPURIOUS RADIATION § 15.109

**CH 661 up to 12 GHz, valid for all accessories, no difference in behavior**



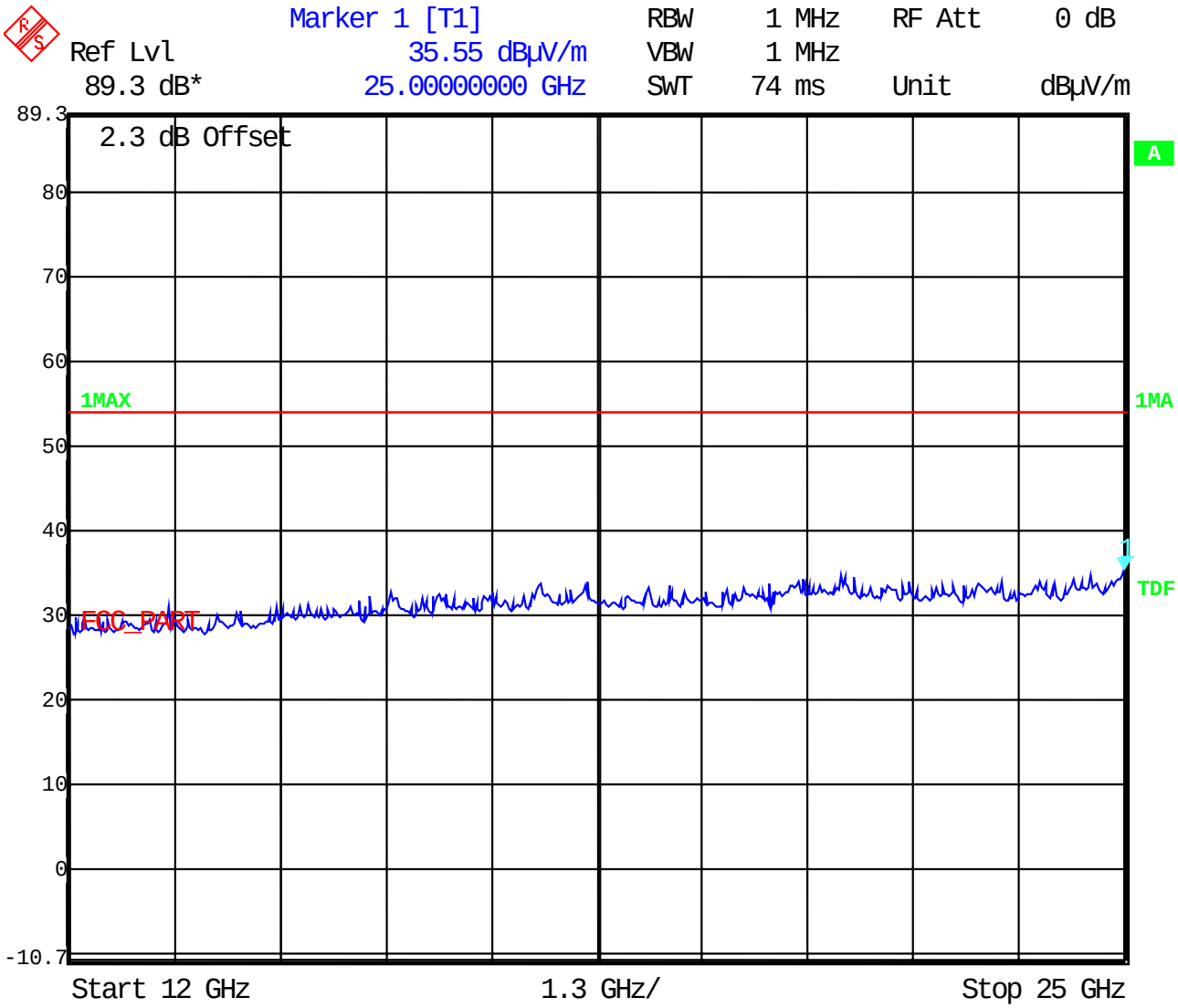

**f < 1 GHz : RBW/VBW: 100 kHz f ≥ 1GHz : RBW/VBW 1 MHz**

**Carrier suppressed with a rejection filter**

**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**
**(for reference numbers see test equipment listing)**
**17 – 24, 64**

**SPURIOUS RADIATION § 15.109**

**CH 661 up to 25 GHz, valid for all accessories, no difference in behavior**



**TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS**

**To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.**

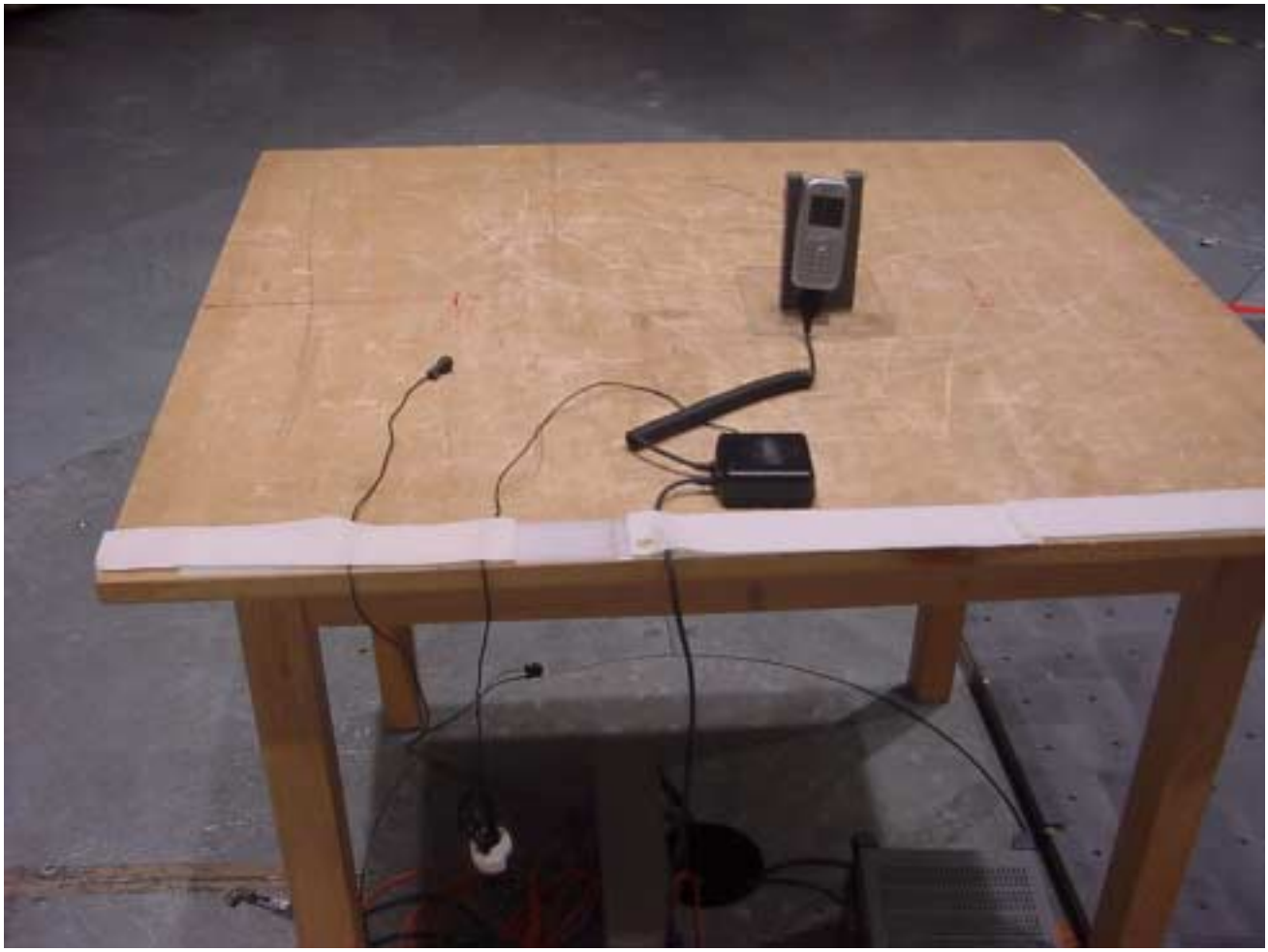
| No | Instrument/Ancillary | Type | Manufacturer | Serial No. |
|---|---|---|---|---|
| 01 | Spectrum Analyzer | 8566 A | Hewlett-Packard | 1925A00257 |
| 02 | Analyzer Display | 8566 A | Hewlett-Packard | 1925A00860 |
| 03 | Oscilloscope | 7633 | Tektronix | 230054 |
| 04 | Radio Communication Analyzer | CMTA 54 | Rohde & Schwarz | 894 043/010 |
| 05 | System Power Supply | 6038 A | Hewlett-Packard | 2848A07027 |
| 06 | Signal Generator | 8111 A | Hewlett-Packard | 2215G00867 |
| 07 | Signal Generator | 8662 A | Hewlett-Packard | 2224A01012 |
| 08 | Function Generator | AFGU | Rohde & Schwarz | 862 480/032 |
| 09 | Regulating Transformer | MPL | Erfi | 91350 |
| 10 | LISN | NNLA 8120 | Schwarzbeck | 8120331 |
| 11 | Relay-Matrix | PSU | Rohde & Schwarz | 893 285/020 |
| 12 | Power-Meter | 436 A | Hewlett-Packard | 2101A12378 |
| 13 | Power-Sensor | 8484 A | Hewlett-Packard | 2237A10156 |
| 14 | Power-Sensor | 8482 A | Hewlett-Packard | 2237A00616 |
| 15 | Modulation Meter | 9008 | Racal-Dana | 2647 |
| 16 | Frequency Counter | 5340 A | Hewlett-Packard | 1532A03899 |
| 17 | Anechoic Chamber | --- | MWB | 87400/002 |
| 18 | Spectrum Analyzer | 85660 B | Hewlett-Packard | 2747A05306 |
| 19 | Analyzer Display | 85662 A | Hewlett-Packard | 2816A16541 |
| 20 | Quasi Peak Adapter | 85650 A | Hewlett-Packard | 2811A01131 |
| 21 | RF-Preselector | 85685 A | Hewlett-Packard | 2833A00768 |
| 22 | Biconical Antenna | 3104 | Emco | 3758 |
| 23 | Log. Per. Antenna | 3146 | Emco | 2130 |
| 24 | Double Ridged Horn | 3115 | Emco | 3088 |
| 25 | EMI-Testreceiver | ESAI | Rohde & Schwarz | 863 180/013 |
| 26 | EMI-Analyzer-Display | ESAI-D | Rohde & Schwarz | 862 771/008 |
| 27 | Biconical Antenna | HK 116 | Rohde & Schwarz | 888 945/013 |
| 28 | Log. Per. Antenna | HL 223 | Rohde & Schwarz | 825 584/002 |
| 29 | Relay-Switch-Unit | RSU | Rohde & Schwarz | 375 339/002 |
| 30 | Highpass | HM985955 | FSY Microwave | 001 |
| 31 | Amplifier | P42-GA29 | Tron-Tech | B 23602 |
| 32 | Anechoic Chamber | | Frankonia | |
| 33 | Control Computer | PSM 7 | Rohde & Schwarz | 834 621/004 |
| 34 | EMI Test Receiver | ESMI | Rohde & Schwarz | 827 063/010 |
| 35 | EMI Test Receiver | Display | Rohde & Schwarz | 829 808/010 |

**TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS**

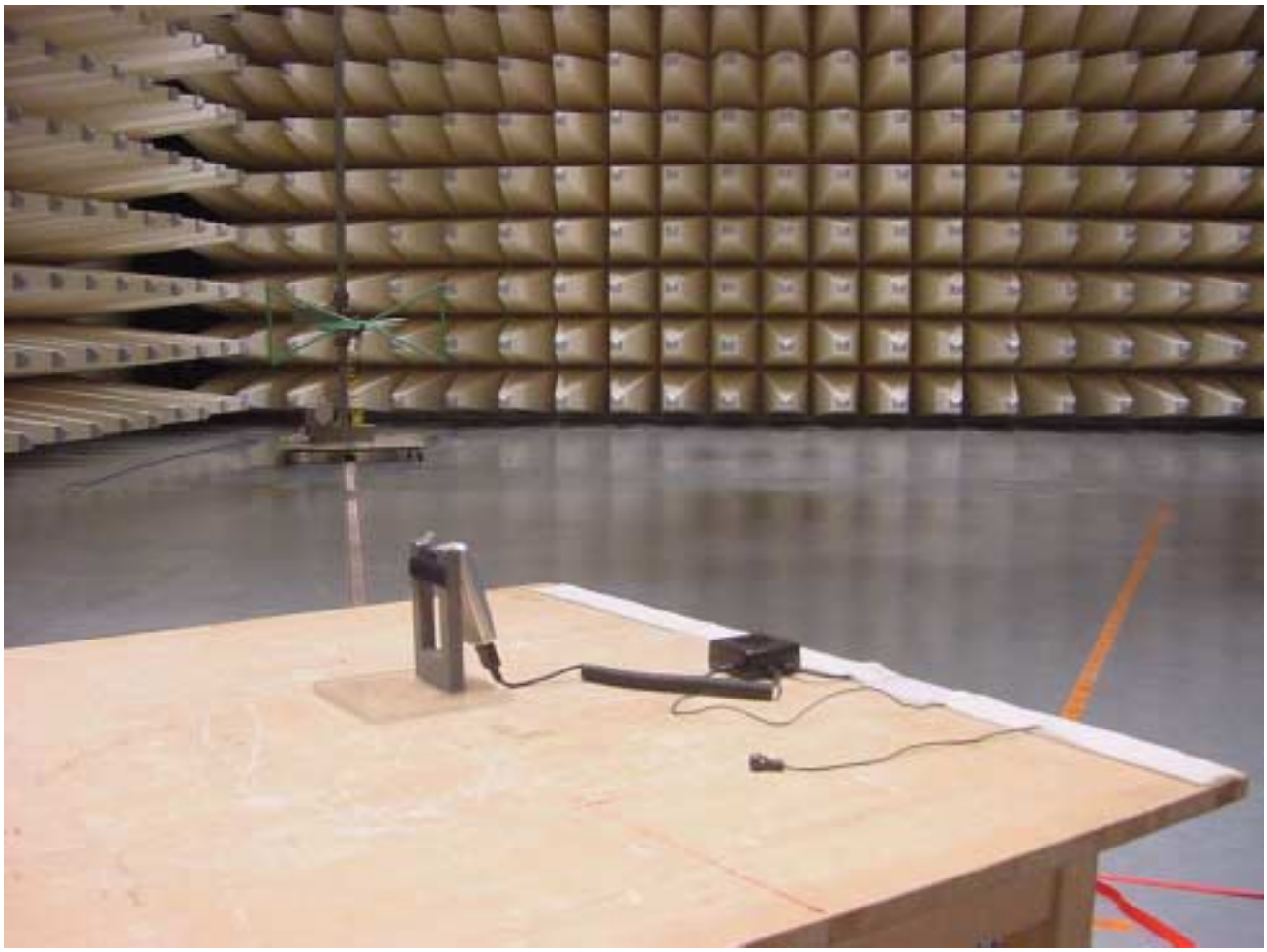
**To simplify the identification on each page of the test equipment used, on each page of the test report, each item of test equipment and ancillaries such as cables are identified (numbered) by the Test Laboratory, below.**

| No | Instrument/Ancillary | Type | Manufacturer | Serial No. |
|---|---|---|---|---|
| 36 | Control Computer | HD 100 | Deisel | 100/322/93 |
| 37 | Relay Matrix | PSN | Rohde & Schwarz | 829 065/003 |
| 38 | Control Unit | GB 016 A2 | Rohde & Schwarz | 344 122/008 |
| 39 | Relay Switch Unit | RSU | Rohde & Schwarz | 316 790/001 |
| 40 | Power Supply | 6032A | Hewlett Packard | 2846A04063 |
| 41 | Spectrum Monitor | EZM | Rohde & Schwarz | 883 720/006 |
| 42 | Measuring Receiver | ESH 3 | Rohde & Schwarz | 890 174/002 |
| 43 | Measuring Receiver | ESVP | Rohde & Schwarz | 891 752/005 |
| 44 | Bicon Ant. 20-300MHz | HK 116 | Rohde & Schwarz | 833 162/011 |
| 45 | Logper Ant. 0.3-1 GHz | HL 223 | Rohde & Schwarz | 832 914/010 |
| 46 | Amplifier 0.1-4 GHz | AFS4 | Miteq Inc. | 206461 |
| 47 | Logper Ant. 1-18 GHz | HL 024 A2 | Rohde & Schwarz | 342 662/002 |
| 48 | Polarisation Network | HL 024 Z1 | Rohde & Schwarz | 341 570/002 |
| 49 | Double Ridged Horn Antenna 1-26.5 GHz | 3115 | EMCO | 9107-3696 |
| 50 | Microw. Sys. Amplifier 0.5- 26.5 GHz | 8317A | Hewlett Packard | 3123A00105 |
| 51 | Audio Analyzer | UPD | Rohde & Schwarz | 1030.7500.04 |
| 52 | Controler | PSM 7 | Rohde & Schwarz | 883 086/026 |
| 53 | DC V-Network | ESH3-Z6 | Rohde & Schwarz | 861 406/005 |
| 54 | DC V-Network | ESH3-Z6 | Rohde & Schwarz | 893 689/012 |
| 55 | AC 2 Phase V-Network | ESH3-Z5 | Rohde & Schwarz | 861 189/014 |
| 56 | AC 2 Phase V-Network | ESH3-Z5 | Rohde & Schwarz | 894 981/019 |
| 57 | AC-3 Phase V-Network | ESH2-Z5 | Rohde & Schwarz | 882 394/007 |
| 58 | Power Supply | 6032A | Rohde & Schwarz | 2933A05441 |
| 59 | RF-Test Receiver | ESVP.52 | Rohde & Schwarz | 881 487/021 |
| 60 | Spectrum Monitor | EZM | Rohde & Schwarz | 883 086/026 |
| 61 | RF-Test Receiver | ESH3 | Rohde & Schwarz | 881 515/002 |
| 62 | Relay Matrix | PSU | Rohde & Schwarz | 882 943/029 |
| 63 | Relay Matrix | PSU | Rohde & Schwarz | 828 628/007 |
| 64 | Spectrum Analyzer | FSIQ 26 | Rohde & Schwarz | 119.6001.27 |
| 65 | Spectrum Analyzer | HP 8565E | Hewlett Packard | 3473A00773 |
| 66 | | | | |
| 67 | | | | |
| 68 | | | | |

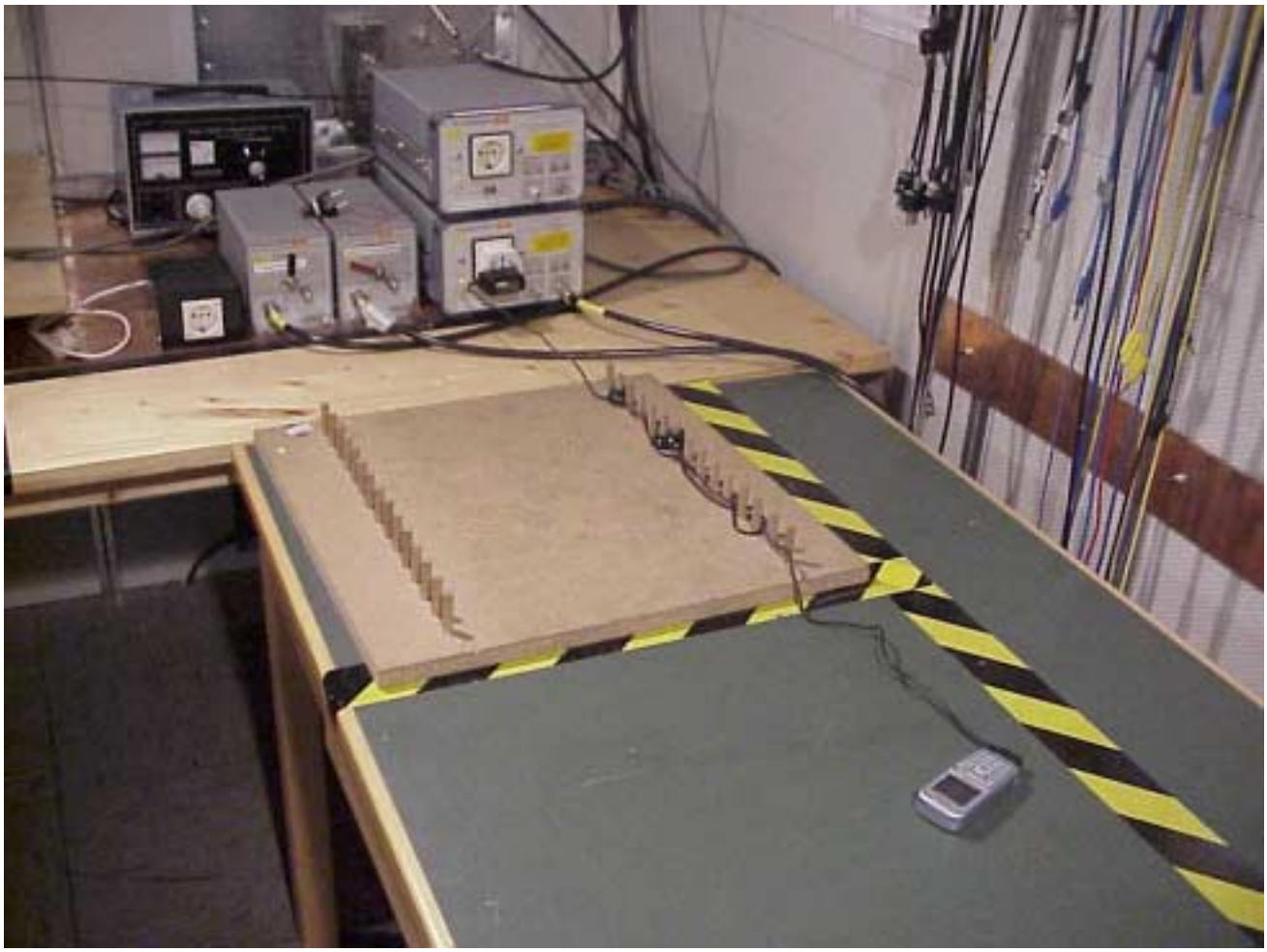
**Test site**



**Test site**



**Test site**

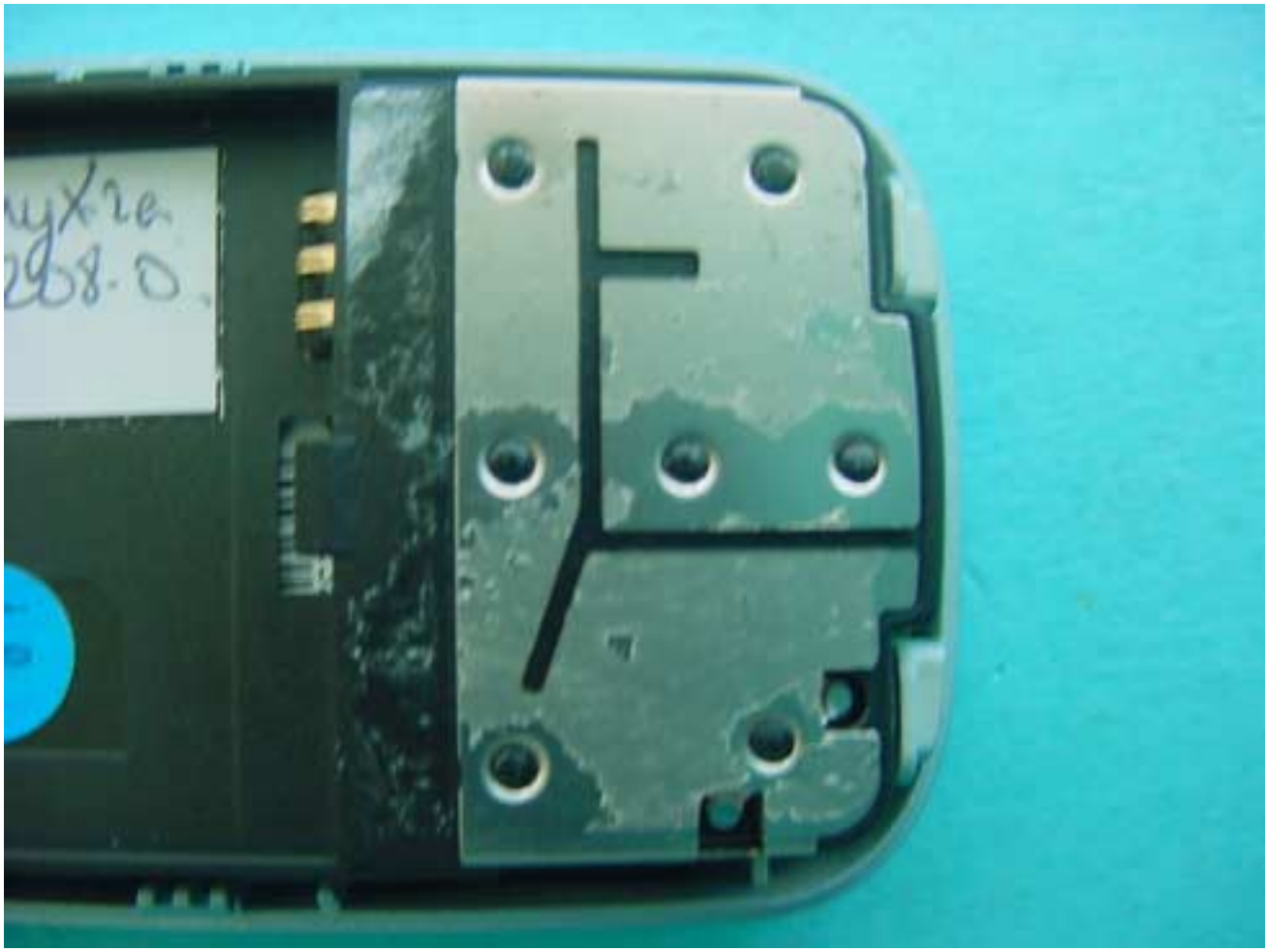


**Photographs of the equipment**

## Photographs of the equipment

## Photographs of the equipment

## Photographs of the equipment



## Photographs of the equipment

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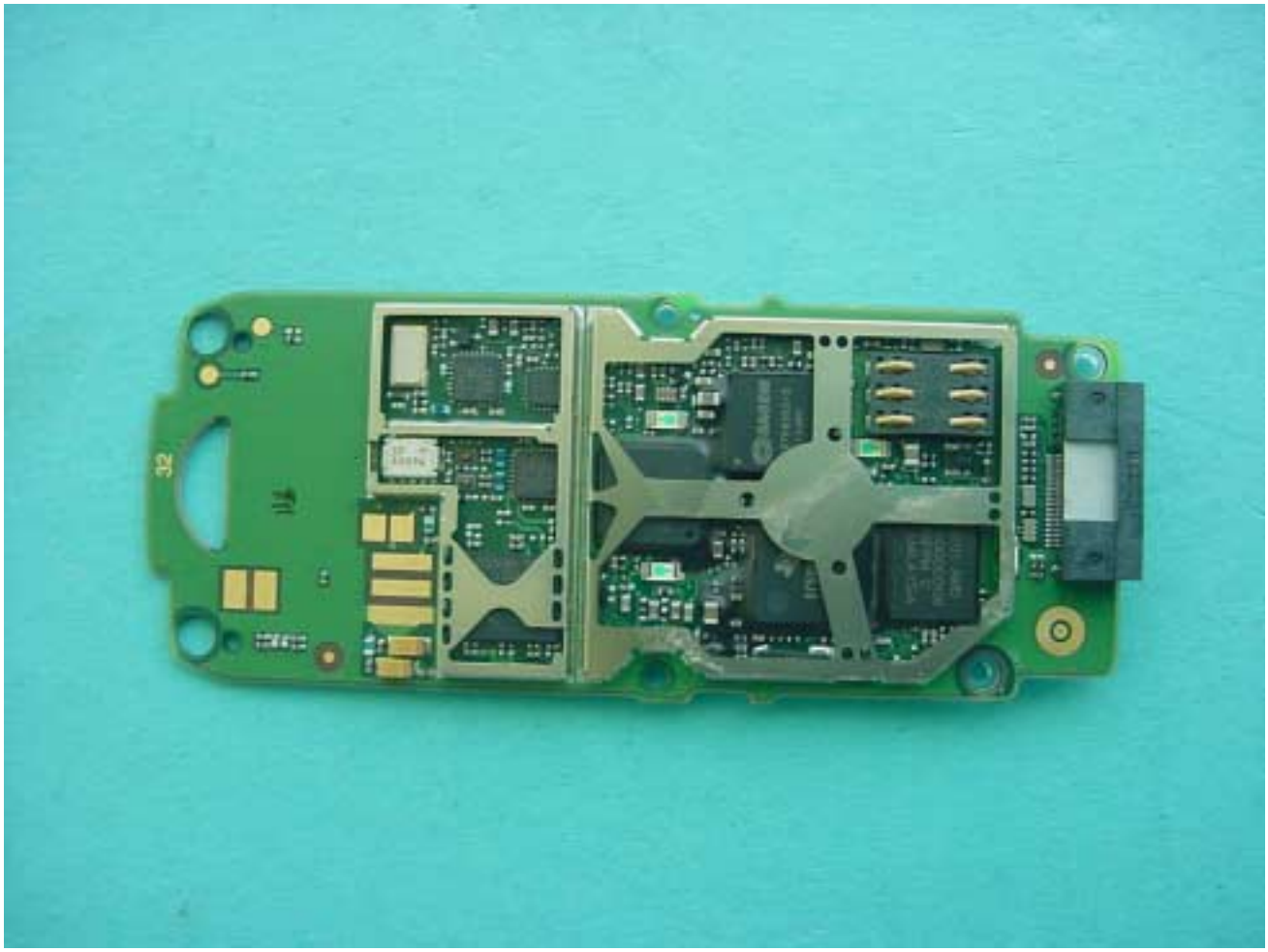
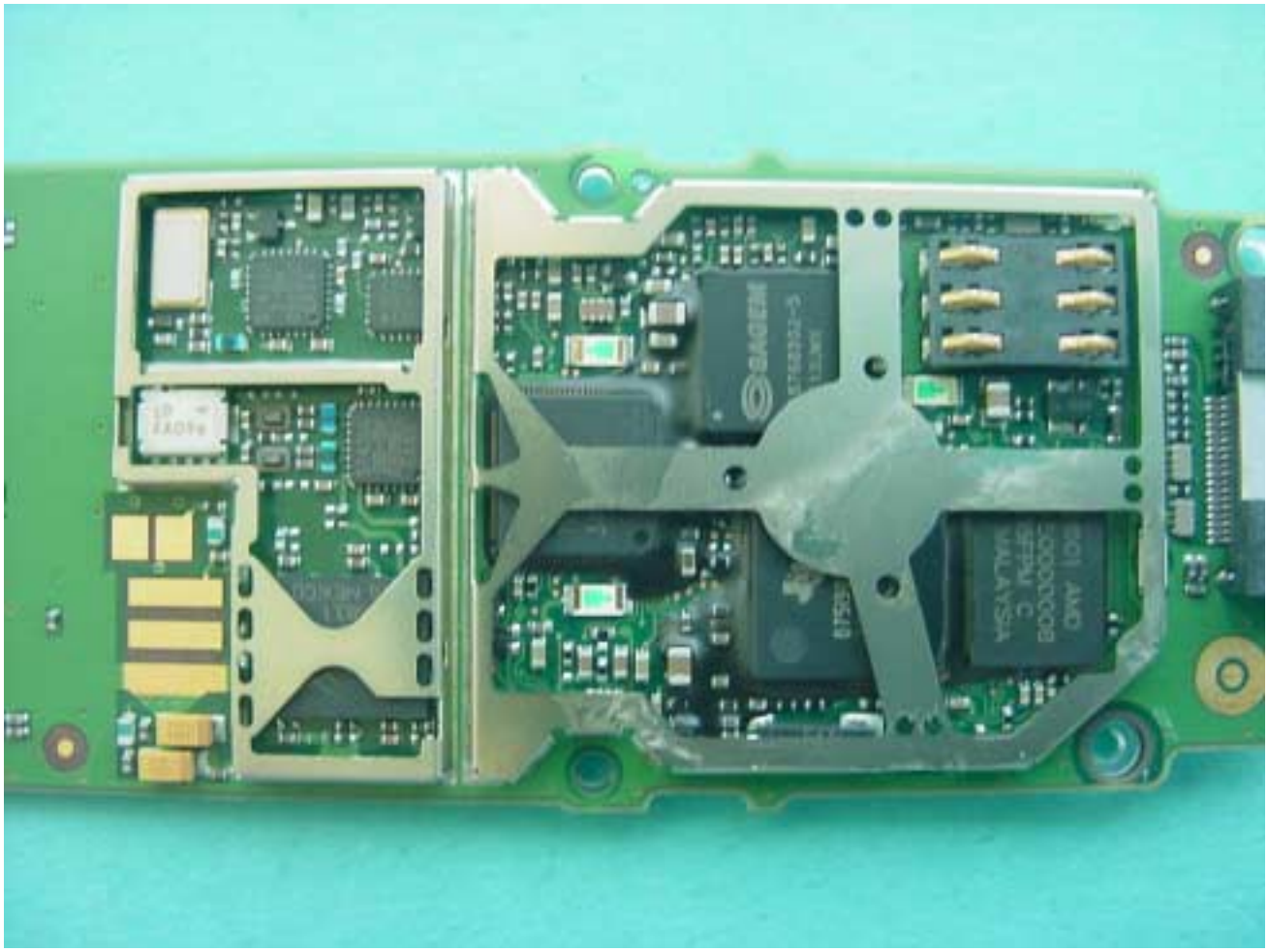


## Photographs of the equipment



## Photographs of the equipment

### TA3651-US

## Photographs of the equipment

### TA3651-US

## Photographs of the equipment

**18805593-9**

## Photographs of the equipment

**18805593-9**

## Photographs of the equipment

### 3515 045E040E

## Photographs of the equipment

**3515 045E040E**

## Photographs of the equipment

**23811253-7 and 23810787-0**

## Photographs of the equipment

**23811253-7 and 23810787-0**

## Photographs of the equipment

**23811253-7 and 23810787-0**

## Photographs of the equipment

**23812517-0**

## Photographs of the equipment

**A17-BA10-010**

## Photographs of the equipment

**A17-BA10-010**