

# CETECOM ICT Services GmbH

Radio Satellite Communication

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RSC14

issue test report consist of 59 Pages

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

|                                        |
|----------------------------------------|
| <h2>Accredited Testing Laboratory</h2> |
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|                                                              |
|--------------------------------------------------------------|
| <p><b>DAR-Registration number:<br/>TTI-P-G 166/98-20</b></p> |
|--------------------------------------------------------------|

**Test report no.:4-0471-01-02/01**  
**FCC Part 24**  
**Handportable TELIT GM825**

CETECOM – ICT Services GmbH  
Untertürkheimerstr. 6-10  
66117 Saarbrücken, Germany

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### **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 generalisations 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

Germany

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Internet : www.cetecom.de

**Accredited testing laboratory**

**DAR-registration number : TTI-P-G 166/98-20**

## 1.3 Details of applicant

**Name** : TELIT MOBILE TERMINAKS S.p.A.  
**Street** : Viale Stazione Prosecco n. 5/b  
**City** : I-34010 SGONICO – TRIESTE  
**Country** : ITALY  
**Telephone** : +39 040 4192 262  
**Telefax** : +39 040 2512 57  
**Contact** : Mr. Tomaz Petaros  
**Telephone** : +39 040 4192 262

## 1.4 Application details

**Date of receipt of application** : 24.10.01  
**Date of receipt of test item** : 24.10.01  
**Date of test** : 24.10 – 31.10.01

## 1.5 Test item

**Type of equipment** : GSM 900/1800/1900 Mobile Phone  
**Type designation** : GM825  
**Manufacturer** : applicant  
**Street** :  
**City** :  
**Country** :  
**IMEI** : 004400441860044 / 004400441860002

### Additional informations: :

**Frequency** : 1850 - 1910 MHz  
**Type of modulation** : 300KGXW  
**Number of channels** : 300  
**Antenna** : integral antenna and socket  
**Power supply** : 3.6 VDC accu Ni-Mh  
**Output power** : 28.54 dBm Peak cond./ ERP : 24.8 dBm (Burst); EIRP: 26.9 dBm (Burst)  
**Type of equipment** : Temperature range : -30°C - +60°C  
**FCC – ID** :  
**Hardware** : 0  
**Software** : 3.01.002

## 1.6 Test standards: FCC Part 24

## 2 Technical test

### 2.1 Summary of test results

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 :

08.11.01 RSC 8411 Berg M.



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| Date | Section | Name | Signature |
|------|---------|------|-----------|
|------|---------|------|-----------|

Technical responsibility for area of testing :

08.11.01 RSC8414 Ames



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| Date | Section | Name | Signature |
|------|---------|------|-----------|
|------|---------|------|-----------|

## **2.2 Testreport**

### **TEST REPORT**

**Testreport no. : 4-0471-01-02/01**

## TEST REPORT REFERENCE

## LIST OF MEASUREMENTS

| <b>PARAMETER TO BE MEASURED Paragraph</b>            | <b>PAGE</b> |
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**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 Spectrum 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            |

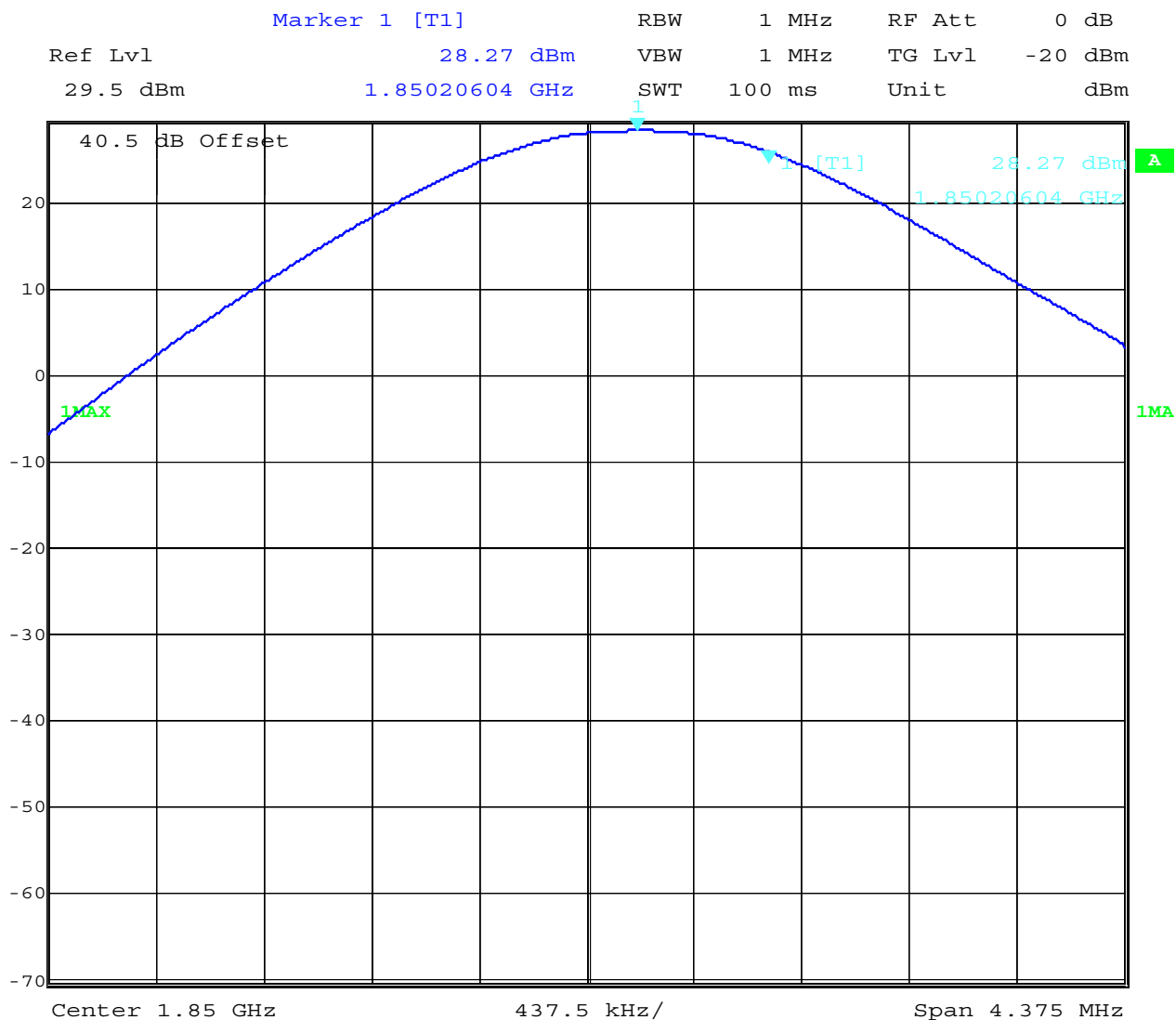
**Power Measurements:****Conducted:**

| Frequency (MHz)         | Power Step | Peak Output Power (dBm) | Average Output Power (dBm) |
|-------------------------|------------|-------------------------|----------------------------|
| 1850.2                  | 0          | 28.27                   | 19.27                      |
| 1880.0                  | 0          | 28.30                   | 19.30                      |
| 1909.8                  | 0          | 28.54                   | 19.54                      |
| Measurement uncertainty |            | ±0.5 dB                 |                            |

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

(for reference numbers see test equipment listing)

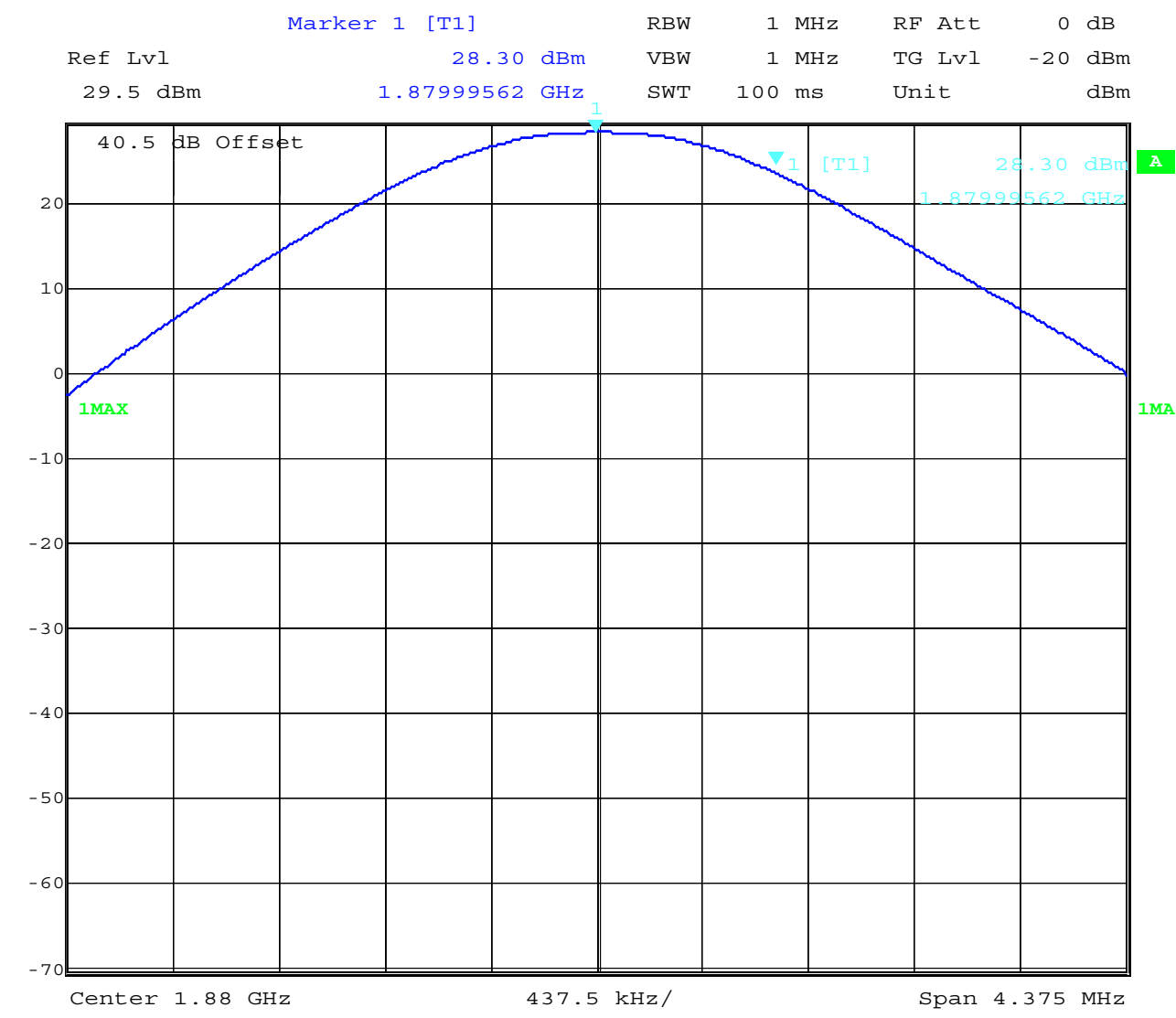
Power output: 1850.2 MHz



Date: 31.OCT.2001 10:08:55

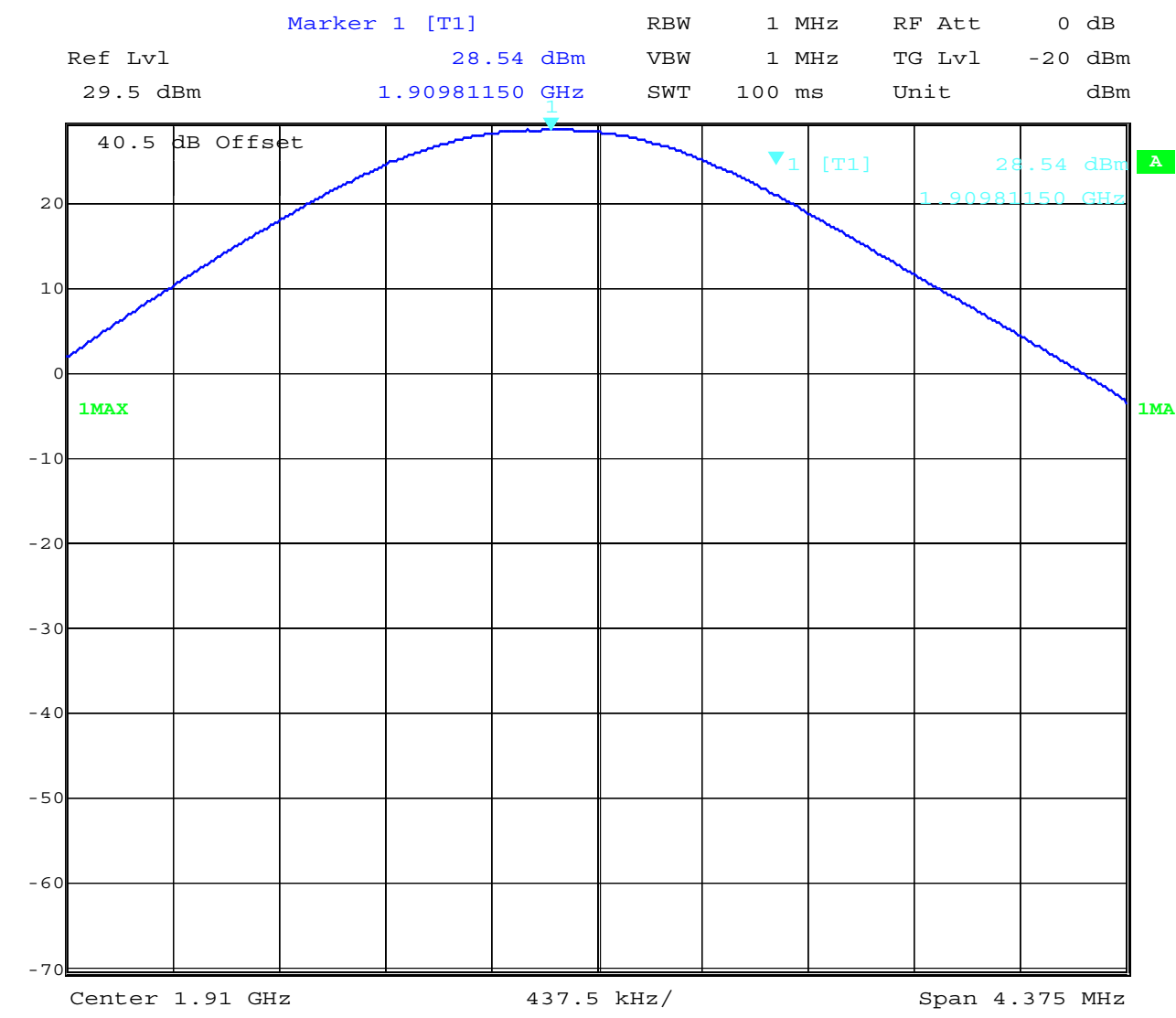
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
 (for reference numbers see test equipment listing)

Power output: 1880.0 MHz



Date:      31.OCT.2001    10:10:25

Power output: 1909.8 MHz



Date:      31.OCT.2001    10:11:42

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

## 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 center 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 coordinates 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 coordinates 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,  $ERP = EIRP - 2.1\text{dBi}$ .

### Limits:

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

## Power Measurements:

### Radiated:

| Frequency<br>(MHz)      | Power Step | BURST AVERAGE<br>(dBm) |      | MODULATION AVERAGE<br>(dBm) |      |
|-------------------------|------------|------------------------|------|-----------------------------|------|
|                         |            | EIRP                   | ERP  | EIRP                        | ERP  |
| 1850.2                  | 0          | 26.9                   | 24.8 | 17.9                        | 15.8 |
| 1880.0                  | 0          | 26.7                   | 24.6 | 17.7                        | 15.6 |
| 1909.8                  | 0          | 26.9                   | 24.8 | 17.9                        | 15.8 |
| Measurement uncertainty |            | ±0.5 dB                |      |                             |      |

## REFERENCE NUMBER(S) OF TEST EQUIPMENT USED

(for reference numbers see test equipment listing)

**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 CMD 65 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 via 3.7 Volts, connected to the CMD 65 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.
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, unpowered, before making measurements.
5. Remeasure carrier frequency at room temperature with nominal 3.7 Volts. Vary supply voltage from minimum 3.5 Volts to maximum 4.2 Volts, in 0.1 Volt increments remeasuring carrier frequency at each voltage. Pause at 3.7 Volts for 1 1/2 hours unpowered, 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 via 3.7 Volts, connected to the CMD 65 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, unpowered, 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. As this transceiver is considered "Hand carried, battery powered equipment...", Section 2.1055(d)(2) applies. This requires that the lower voltage for frequency stability testing be specified by the manufacturer. This transceiver is specified to operate with an input voltage of between 3.5 Vdc and 4.2 Vdc, with a nominal voltage of 3.7 Vdc (NI-Mh accu). Operation above or below these voltage limits is prohibited by transceiver software in order to prevent improper operation as well as to protect components from overstress. These voltages represent a tolerance of + 13.5 % and - 5.4 %. For the purposes of measuring frequency stability these voltage limits are to be used.

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

**AFC FREQ ERROR vs. VOLTAGE**

| <b>Voltage<br/>(V)</b> | <b>Frequency Error<br/>(Hz)</b> | <b>Frequency Error<br/>(ppm)</b> |
|------------------------|---------------------------------|----------------------------------|
| 3.5                    | -40                             | -0.021                           |
| 3.6                    | -37                             | -0.020                           |
| 3.7                    | -28                             | -0.015                           |
| 3.8                    | -41                             | -0.021                           |
| 3.9                    | -39                             | -0.021                           |
| 4.0                    | -32                             | -0.017                           |
| 4.1                    | -24                             | -0.013                           |
| 4.2                    | -18                             | -0.010                           |

**AFC FREQ ERROR vs. TEMPERATURE**

| <b>TEMPERATURE<br/>(°C)</b> | <b>Frequency Error<br/>(Hz)</b> | <b>Frequency Error<br/>(ppm)</b> |
|-----------------------------|---------------------------------|----------------------------------|
| -30                         | -57                             | -0.030                           |
| -20                         | -11                             | -0.006                           |
| -10                         | -04                             | -0.002                           |
| ±0.0                        | -18                             | -0.010                           |
| +10                         | -38                             | -0.020                           |
| +20                         | -28                             | -0.015                           |
| +30                         | -16                             | -0.009                           |
| +40                         | -34                             | -0.018                           |
| +50                         | -25                             | -0.013                           |
| +60                         | -48                             | -0.026                           |
|                             |                                 |                                  |

**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 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 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 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 1 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:

$$Pg = E^2 4\pi d^2 / 120\pi = E^2 d^2 / 30$$

where : P = power in watts

g = arithmetic gain of transmitting antenna over isotropic radiator.

E = maximum field strength in volts/meter

d = measurement distance in meter

Using a dipole gain of 1.67 or 2.2 dB and a test distance of 3 meters, this equation reduces to:

$$P(\text{dBm}) = E(\text{dBuV/m}) - 97.2\text{dB}$$

**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  $43 + 10\log(P)$  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.

**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.

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

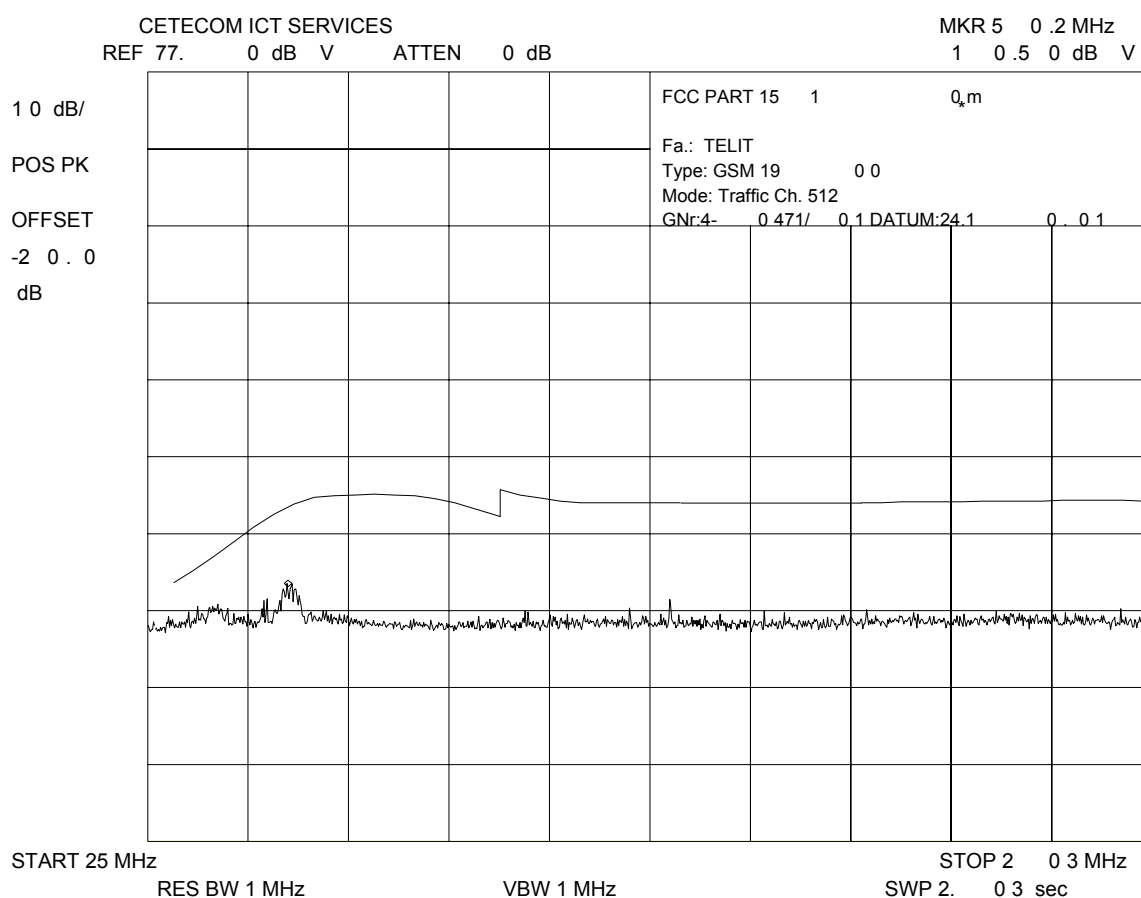
As can be seen from this data, the emissions from the test item were within the specification limit.

## Channel 512 :

$P(\text{dBm}) = E(\text{dBuV/m}) - 97.2\text{dB}$

Spurious emission limit  $-13\text{dBm} = 84,2 \text{ dB}\mu\text{V}$

## 30 – 200 MHz



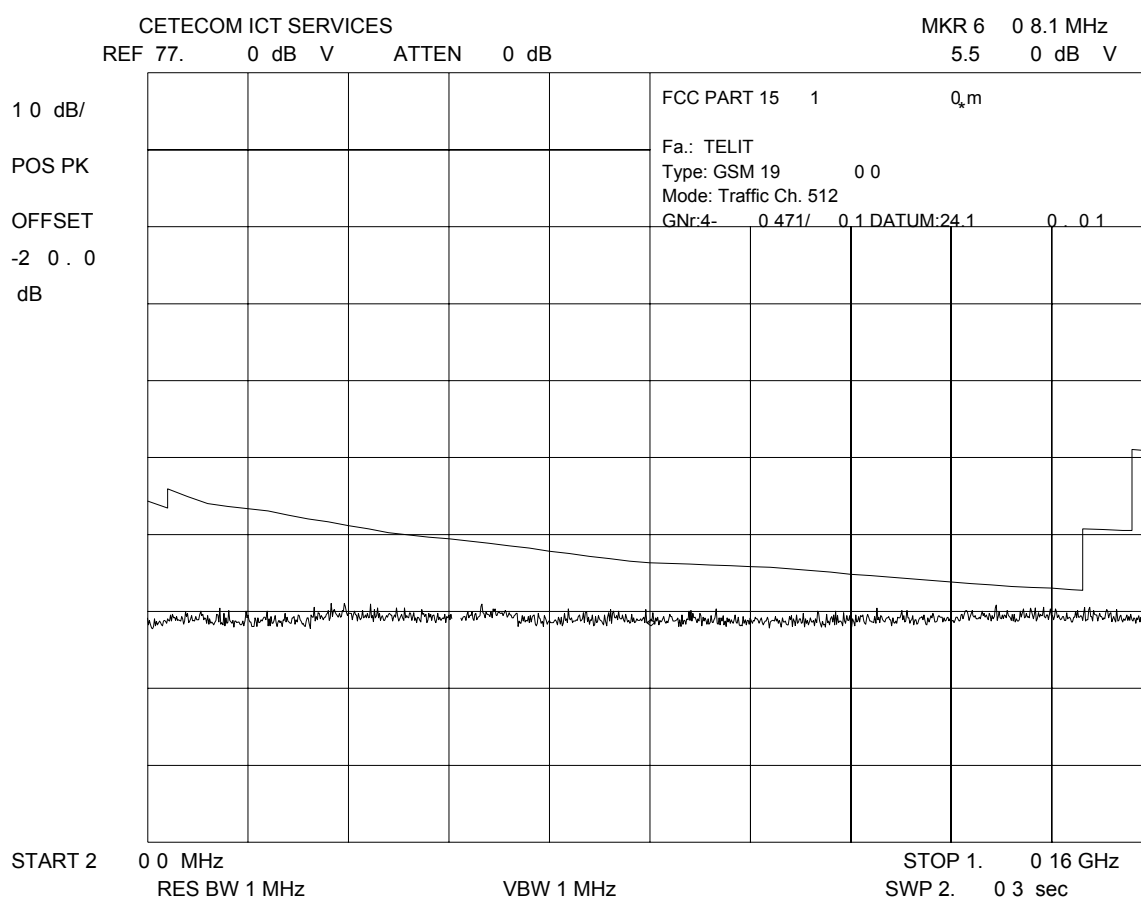
As can be seen from this data, the emissions from the test item were within the specification limit.

## Channel 512 :

$P(\text{dBm}) = E(\text{dBuV/m}) - 97.2\text{dB}$

Spurious emission limit  $-13\text{dBm} = 84,2 \text{ dB}\mu\text{V}$

## 200 – 1000 MHz



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

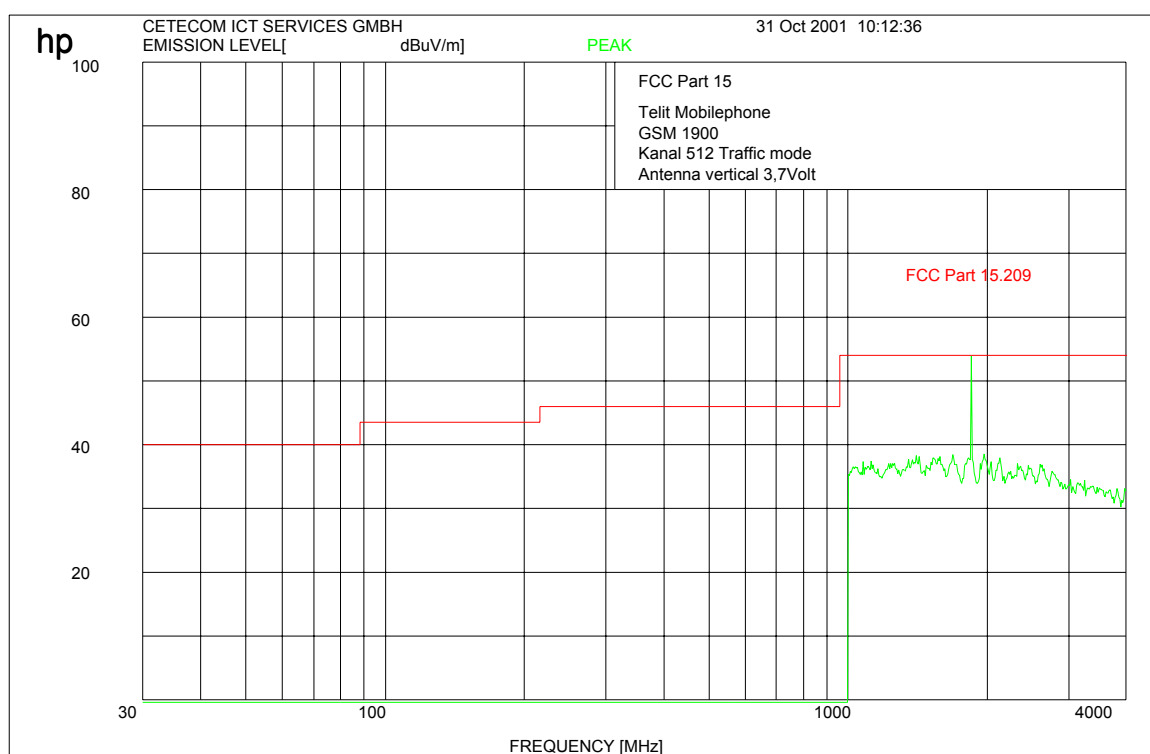
As can be seen from this data, the emissions from the test item were within the specification limit.

## Channel 512 :

$P(\text{dBm}) = E(\text{dBuV/m}) - 97.2\text{dB}$

Spurious emission limit  $-13\text{dBm} = 84,2 \text{ dB}\mu\text{V}$

## 1000 – 4000 MHz



Carrier is notched with a Band Reject Filter

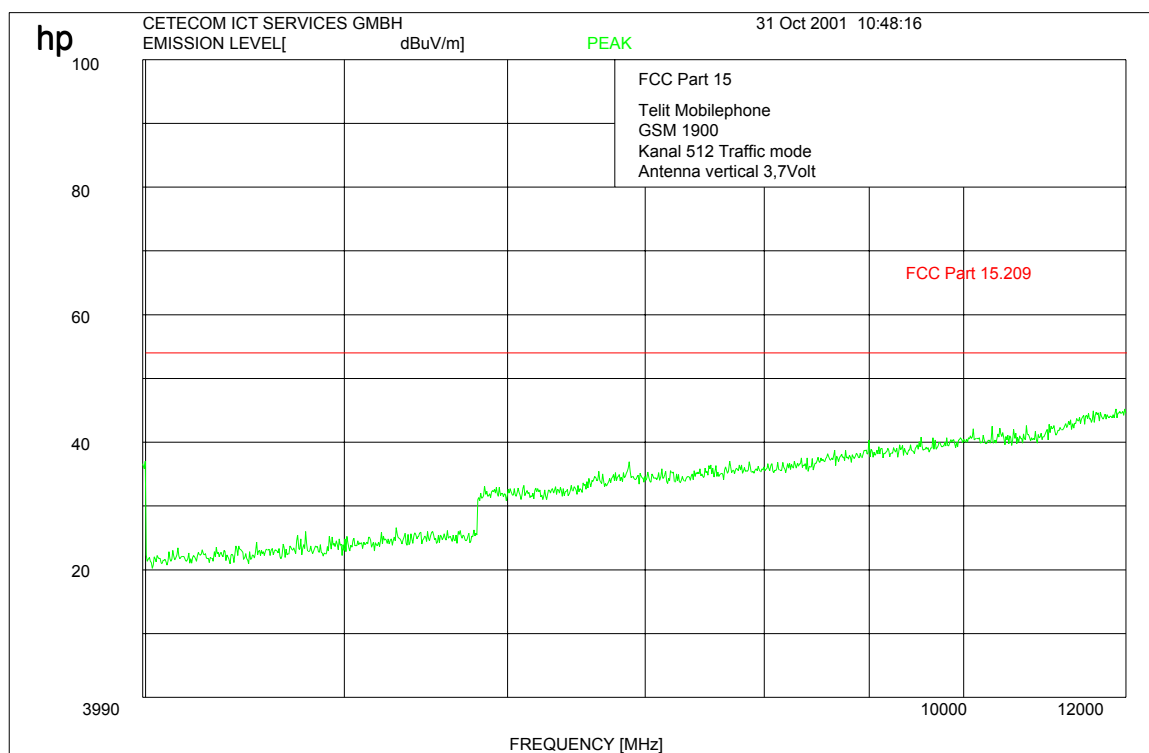
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

## Channel 512 :

$P(\text{dBm}) = E(\text{dBuV/m}) - 97.2\text{dB}$

Spurious emission limit  $-13\text{dBm} = 84,2 \text{ dB}\mu\text{V}$

## 4000 – 12000 MHz



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

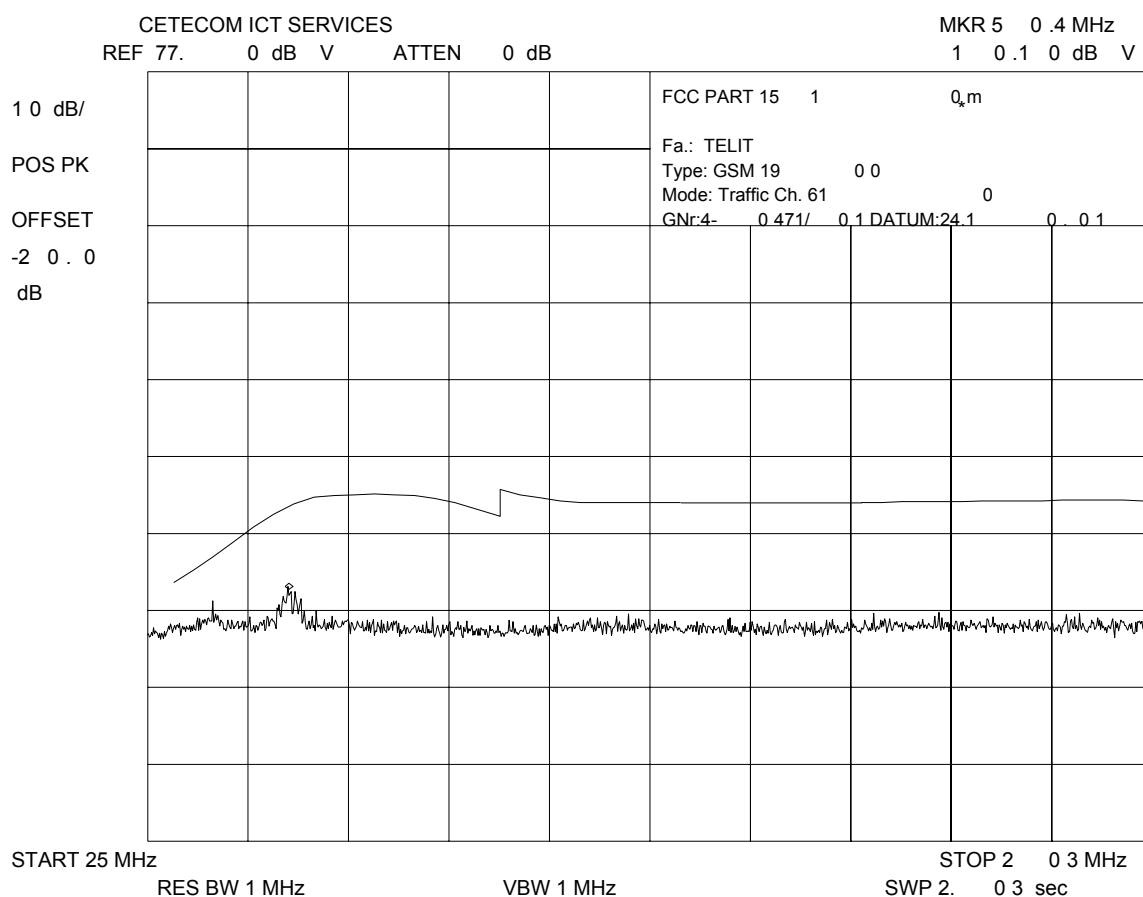
17 - 24

## Channel 661 :

$P(\text{dBm}) = E(\text{dBuV/m}) - 97.2\text{dB}$

Spurious emission limit  $-13\text{dBm} = 84,2\text{ dBuV}$

## 30 – 200 MHz



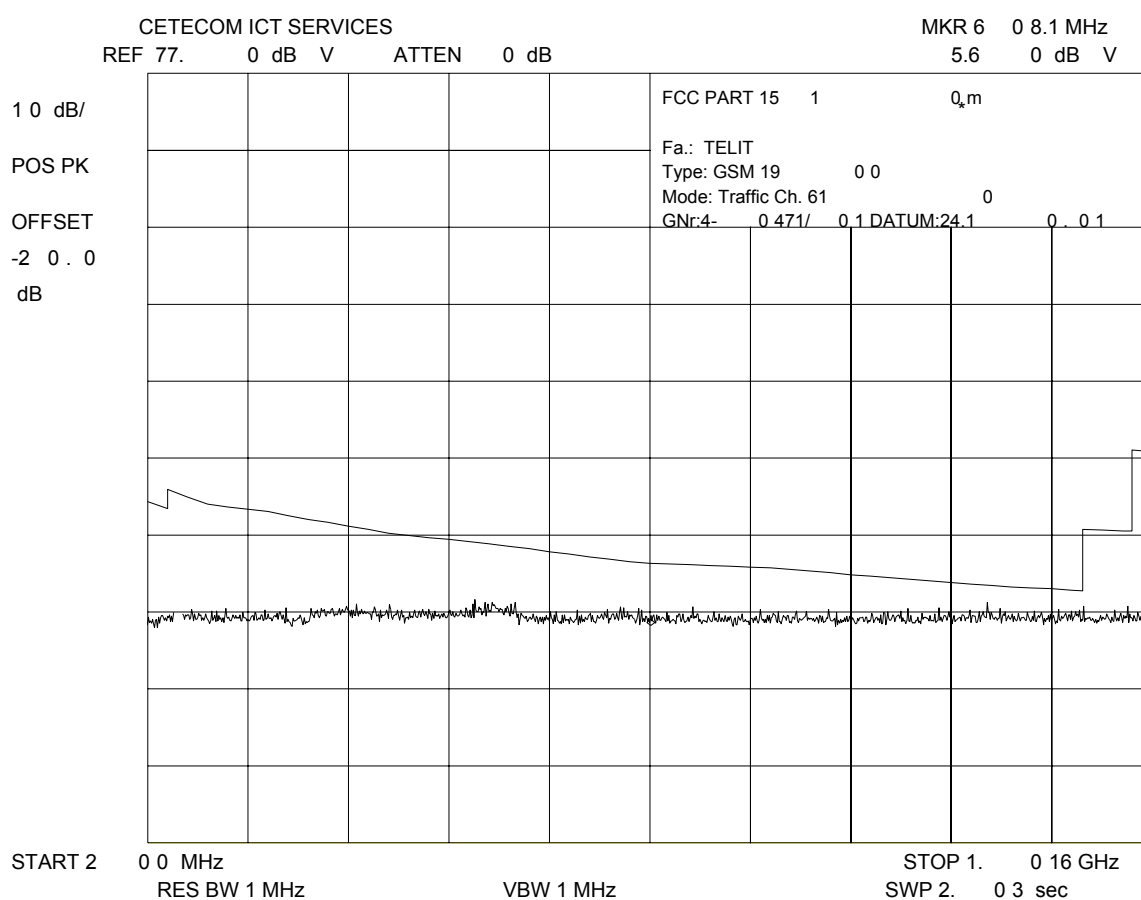
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

## Channel 661 :

$P(\text{dBm}) = E(\text{dBuV/m}) - 97.2\text{dB}$

Spurious emission limit  $-13\text{dBm} = 84,2 \text{ dB}\mu\text{V}$

## 200 – 1000 MHz



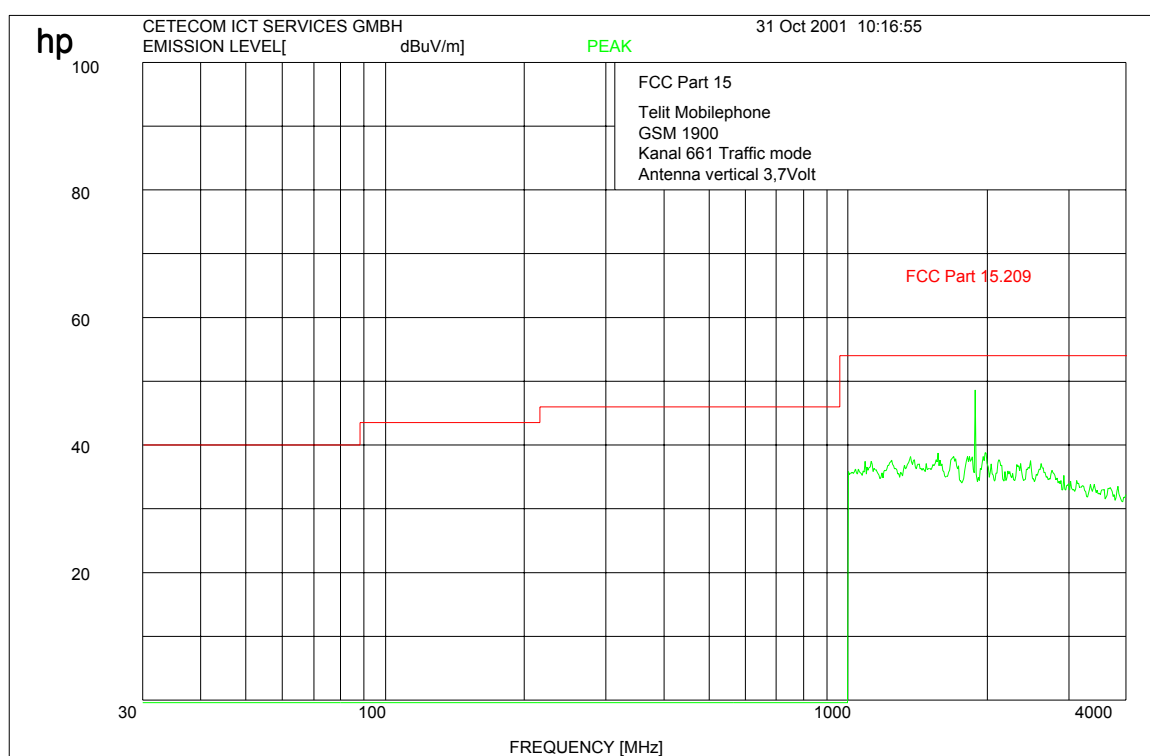
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

## Channel 661 :

$P(\text{dBm}) = E(\text{dBuV/m}) - 97.2\text{dB}$

Spurious emission limit  $-13\text{dBm} = 84,2 \text{ dBuV}$

## 1000 – 4000 MHz



Carrier is notched with a Band Reject Filter

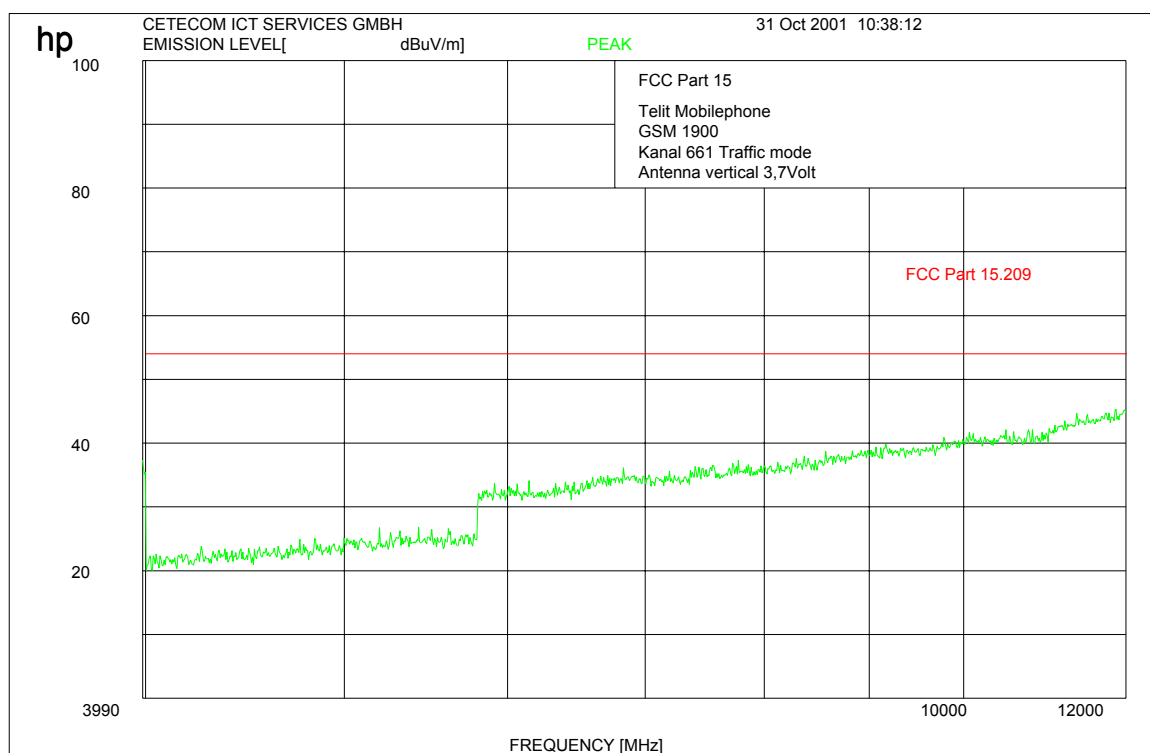
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

## Channel 661 :

$P(\text{dBm}) = E(\text{dBuV/m}) - 97.2\text{dB}$

Spurious emission limit  $-13\text{dBm} = 84,2 \text{ dB}\mu\text{V}$

## 4000 - 12000 MHz



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

Spurious emission limit  $-13\text{dBm} = 84,2 \text{ dB}\mu\text{V}$

CETECOM ICT SERVICES

REF 77. 0 dBuV ATTN 0 dB

MRK 5 0.0 MHz  
11. 0.0 dBuV

10 dB/  
POS PK  
OFFSET  
-20.0  
dB

FCC PART 15 1 Qm  
Fa.: TELIT  
Type: GSM 19 00  
Mode: Traffic Ch. 81 0  
GNR:4- 0.471/ 0.1 DATUM:24.1 0.01

START 25 MHz RES BW 1 MHz VBW 1 MHz STOP 20.3 MHz  
SWP 2. 0.3 sec

The image shows a spectrum plot with a grid. The x-axis represents frequency in MHz, ranging from 25 to 20.3. The y-axis represents power in dB, ranging from -20.0 to 0.0. A signal is visible at 25 MHz with a peak level of -20.0 dB. The plot includes various measurement parameters such as REF 77. 0 dBuV, ATTN 0 dB, MRK 5 0.0 MHz, 11. 0.0 dBuV, FCC PART 15 1 Qm, Fa.: TELIT, Type: GSM 19 00, Mode: Traffic Ch. 81 0, GNR:4- 0.471/ 0.1 DATUM:24.1 0.01, and SWP 2. 0.3 sec.

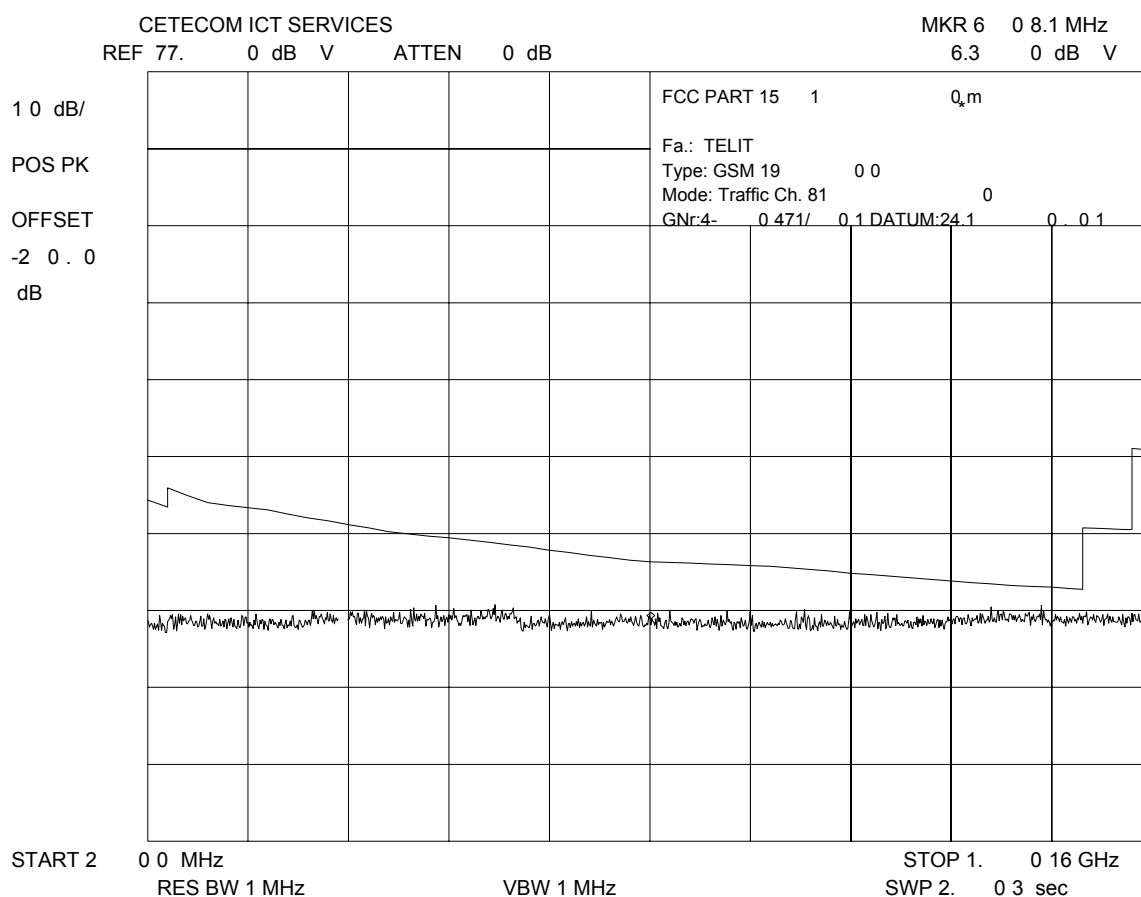
17 - 24

## Channel 810 :

$P(\text{dBm}) = E(\text{dBuV/m}) - 97.2\text{dB}$

Spurious emission limit  $-13\text{dBm} = 84,2 \text{ dB}\mu\text{V}$

## 200 – 1000 MHz



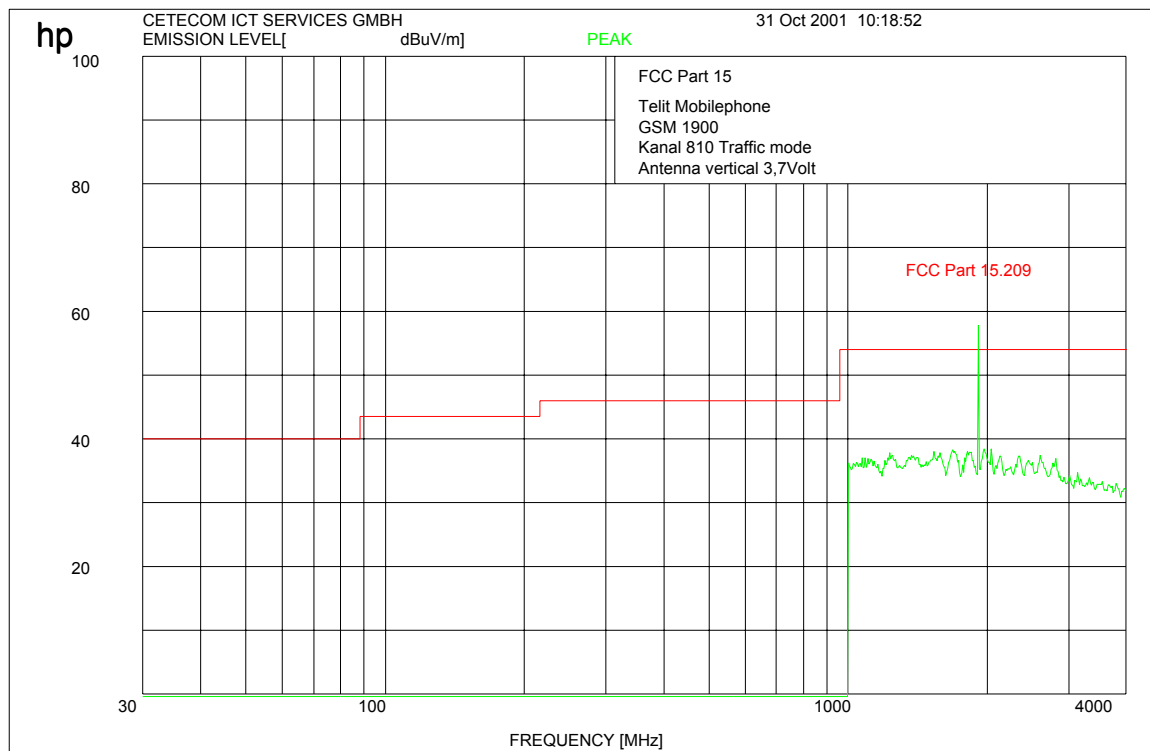
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

## Channel 810 :

$P(\text{dBm}) = E(\text{dBuV/m}) - 97.2\text{dB}$

Spurious emission limit  $-13\text{dBm} = 84,2 \text{ dB}\mu\text{V}$

## 1000 – 4000 MHz



Carrier is notched with a Band Reject Filter

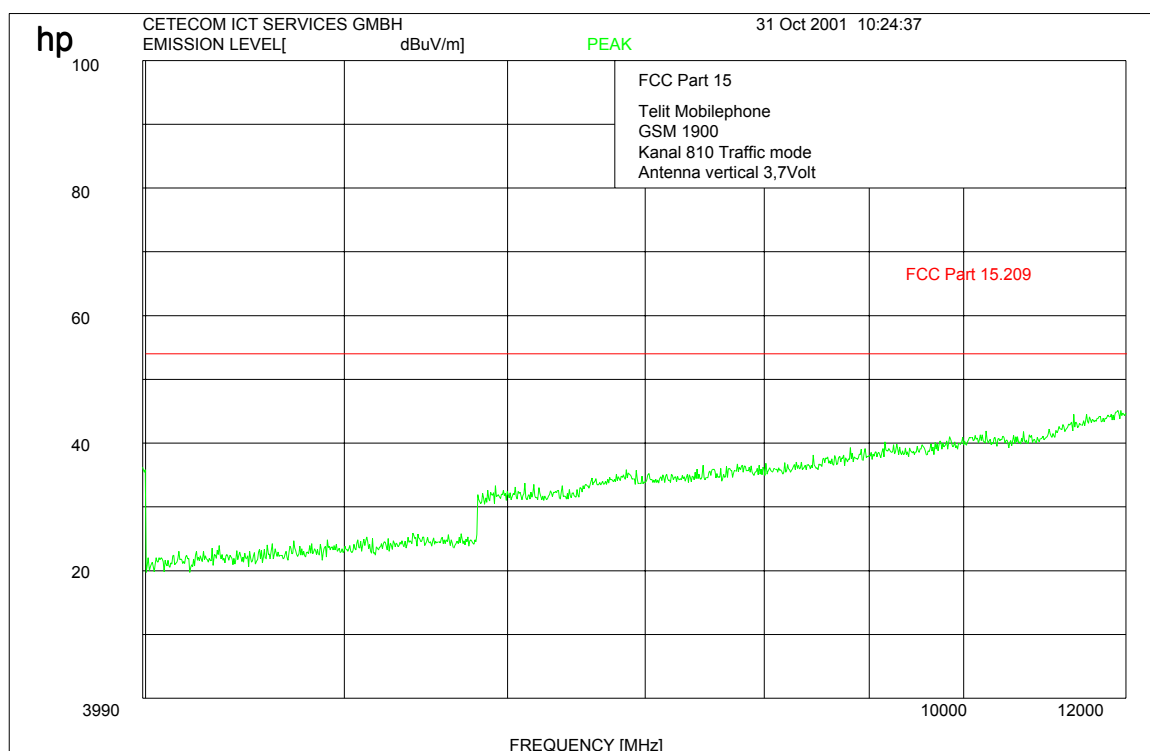
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

## Channel 810 :

$P(\text{dBm}) = E(\text{dBuV/m}) - 97.2\text{dB}$

Spurious emission limit  $-13\text{dBm} = 84,2 \text{ dB}\mu\text{V}$

4000 – 12000 MHz



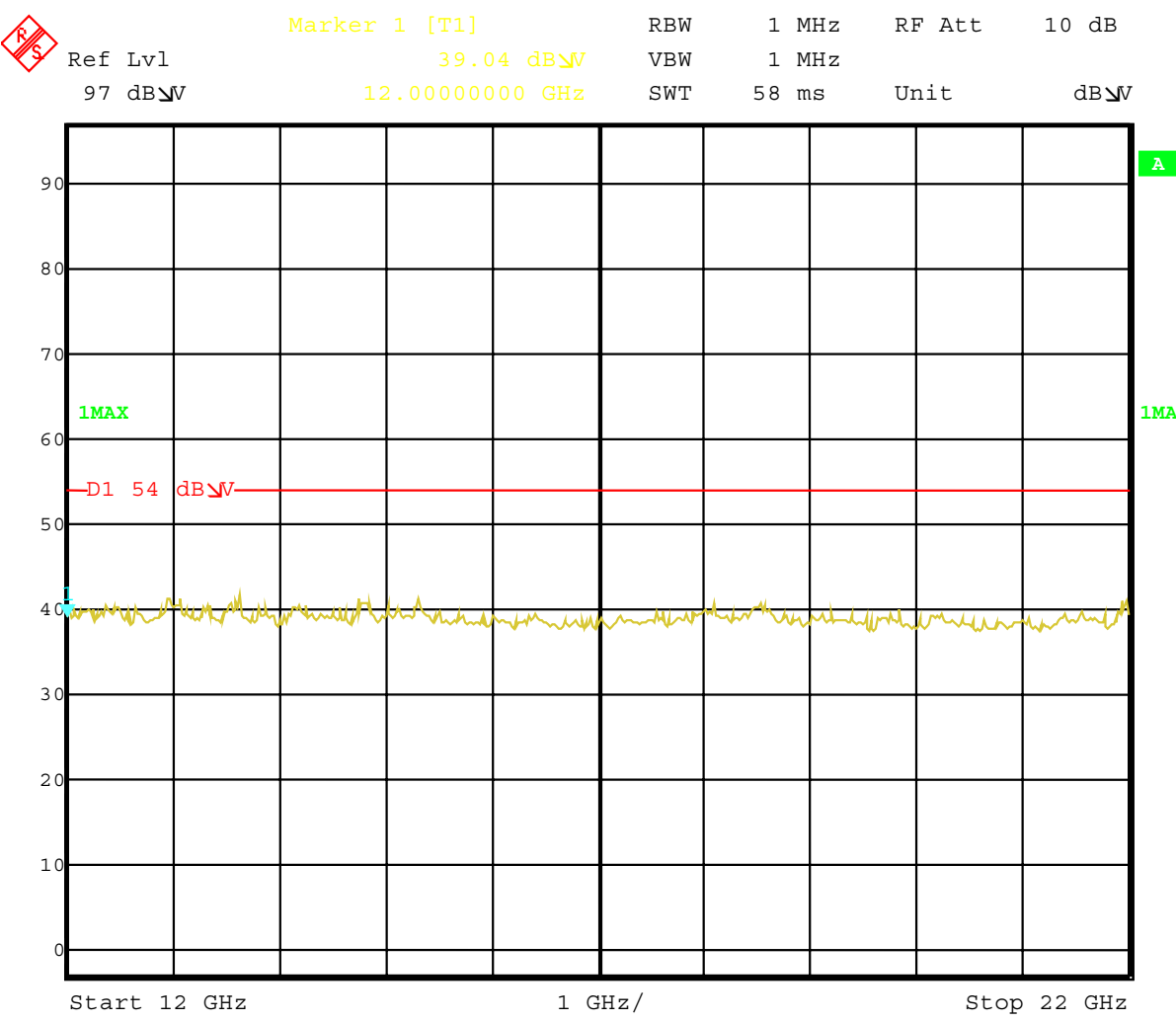
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

Channel 510, 660, 810 (this is valid for all 3 channels)

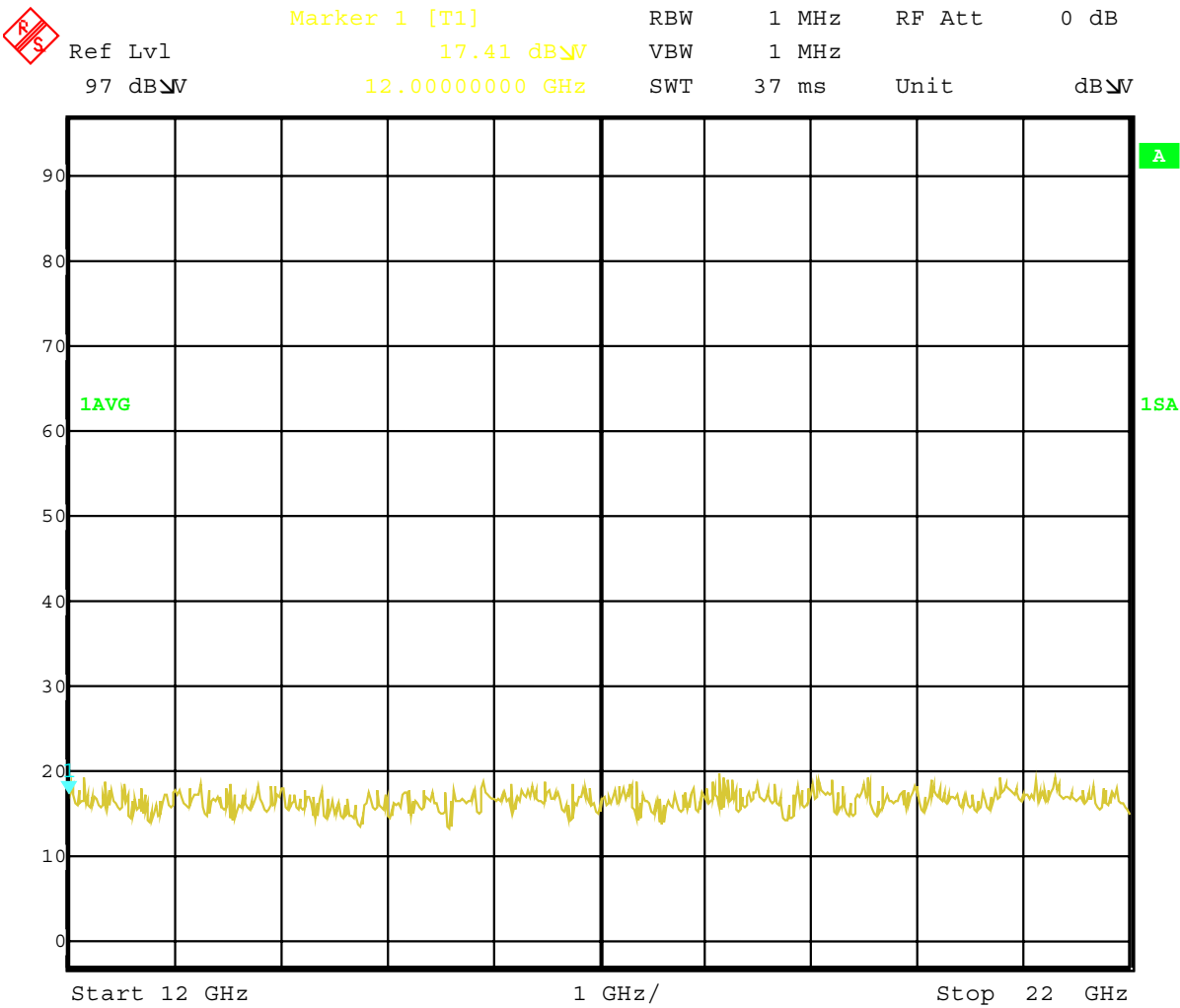
Peak

Spurious emission limit  $-13\text{dBm} = 84,2\text{ dB}\mu\text{V}$

12000 – 20000 MHz

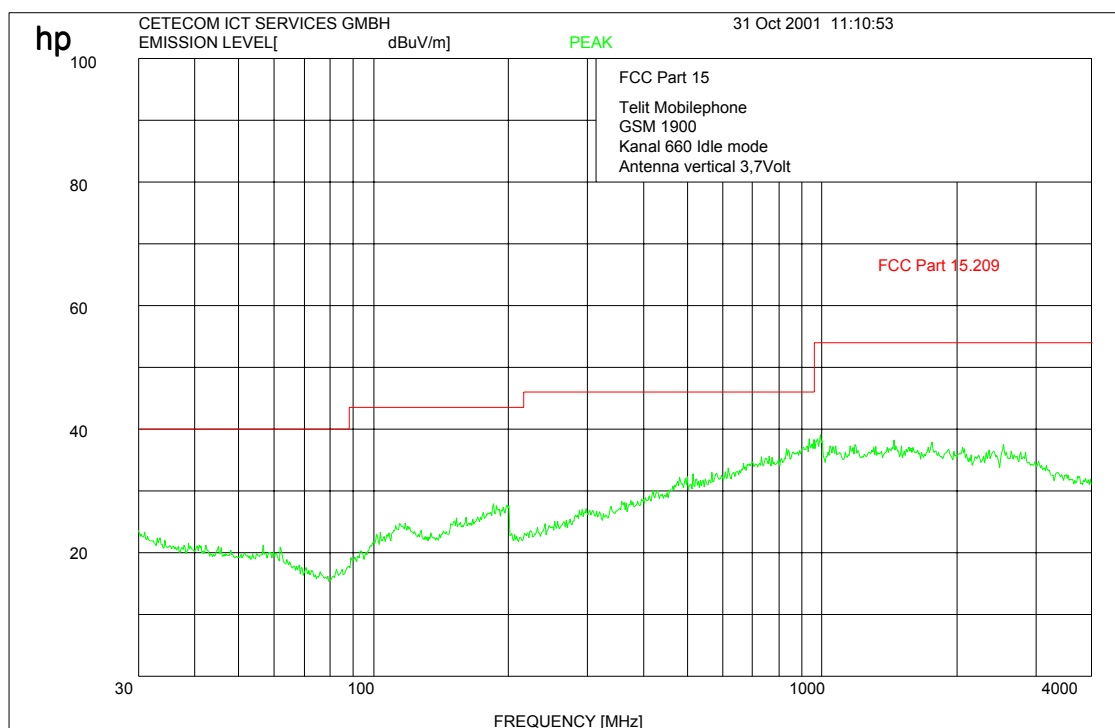


Average



**Channel 660 (this is valid for all 3 channels and up to 20 GHz)**

**Idle-Mode**

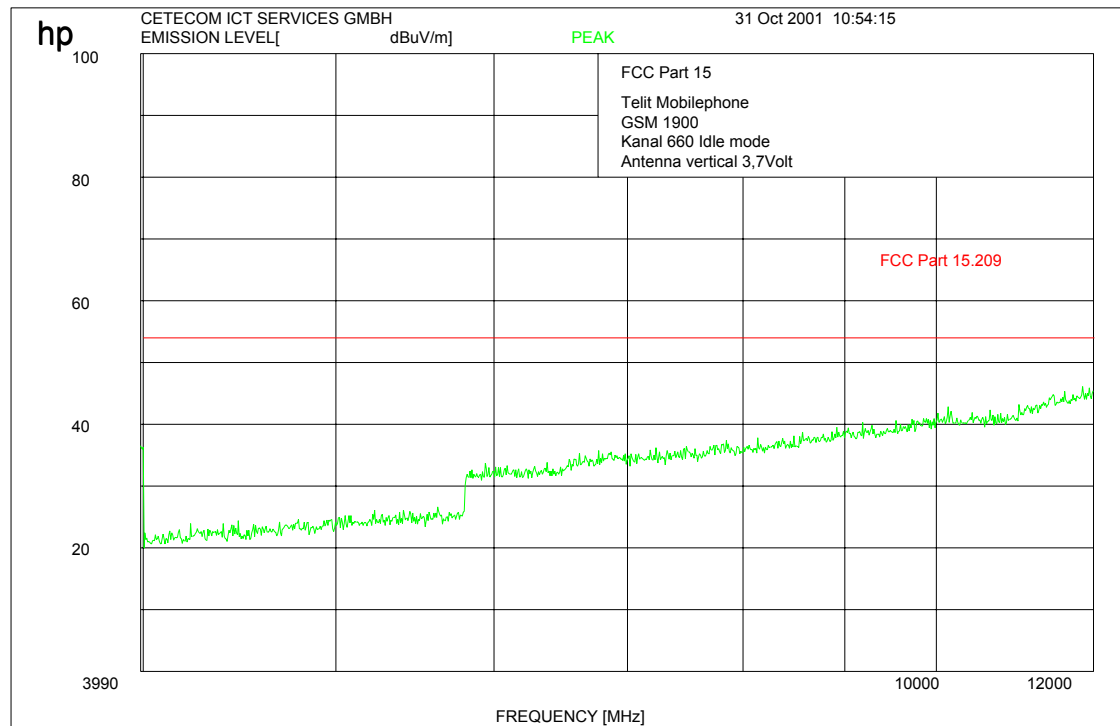


**REFERENCE NUMBER(S) OF TEST EQUIPMENT USED**  
(for reference numbers see test equipment listing)

17 - 24

**Channel 660 (this is valid for all 3 channels and up to 20 GHz)**

**Idle-Mode**



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

## **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

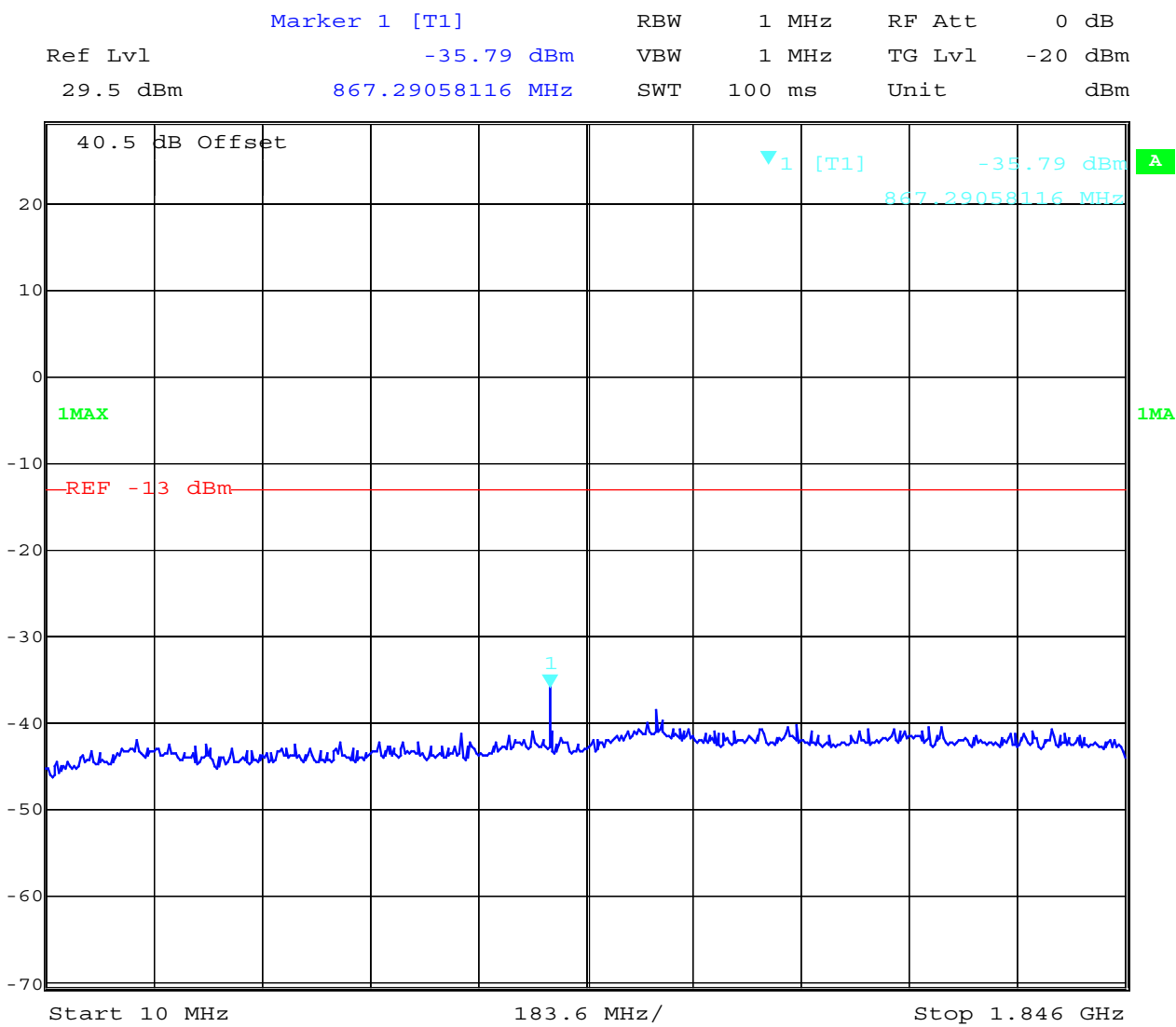
### **Measurement Limit:**

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  $43+10\log(P)$  dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

Measurements:

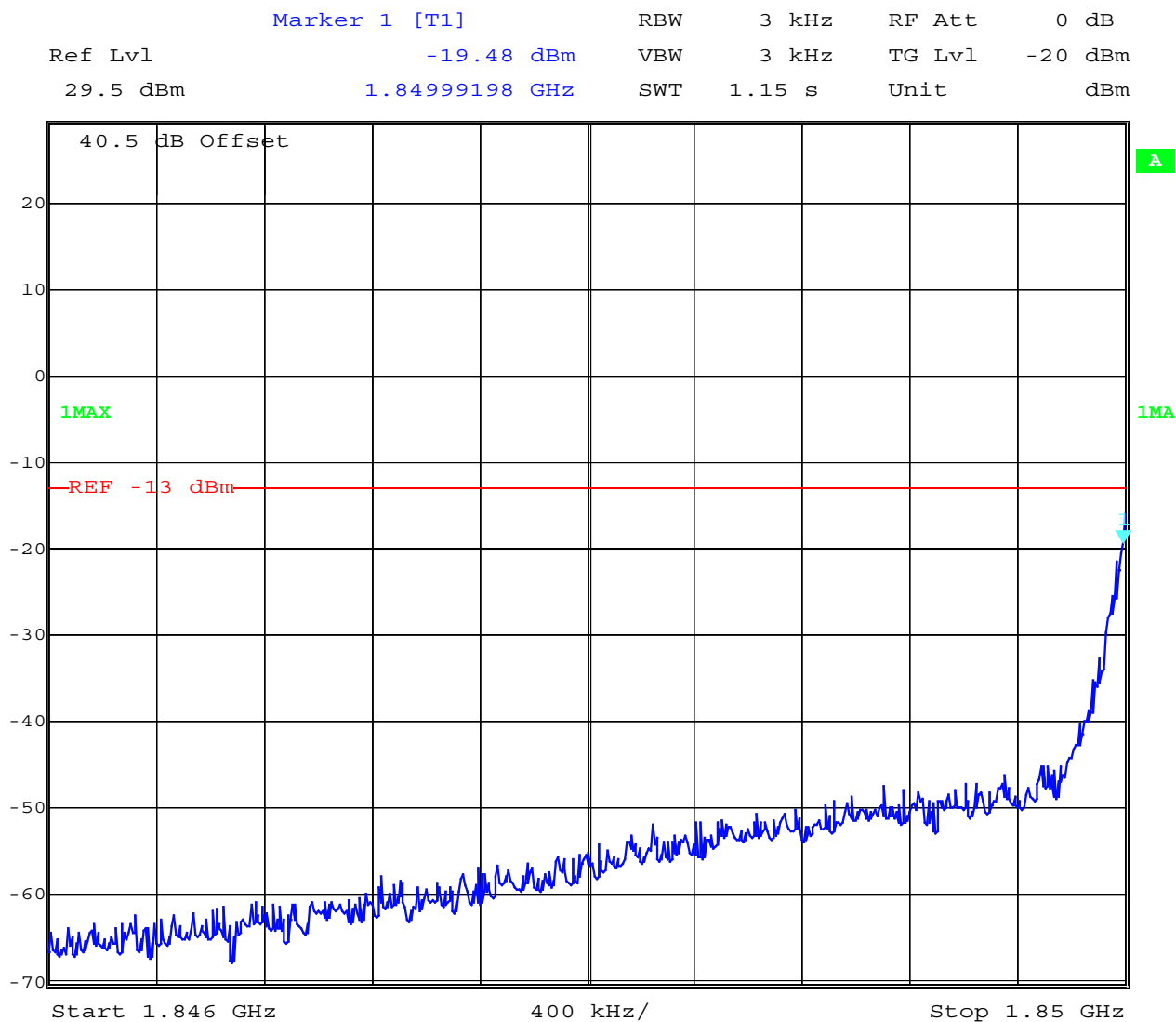
Channel: 512



Date:      31.OCT.2001    10:29:32

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

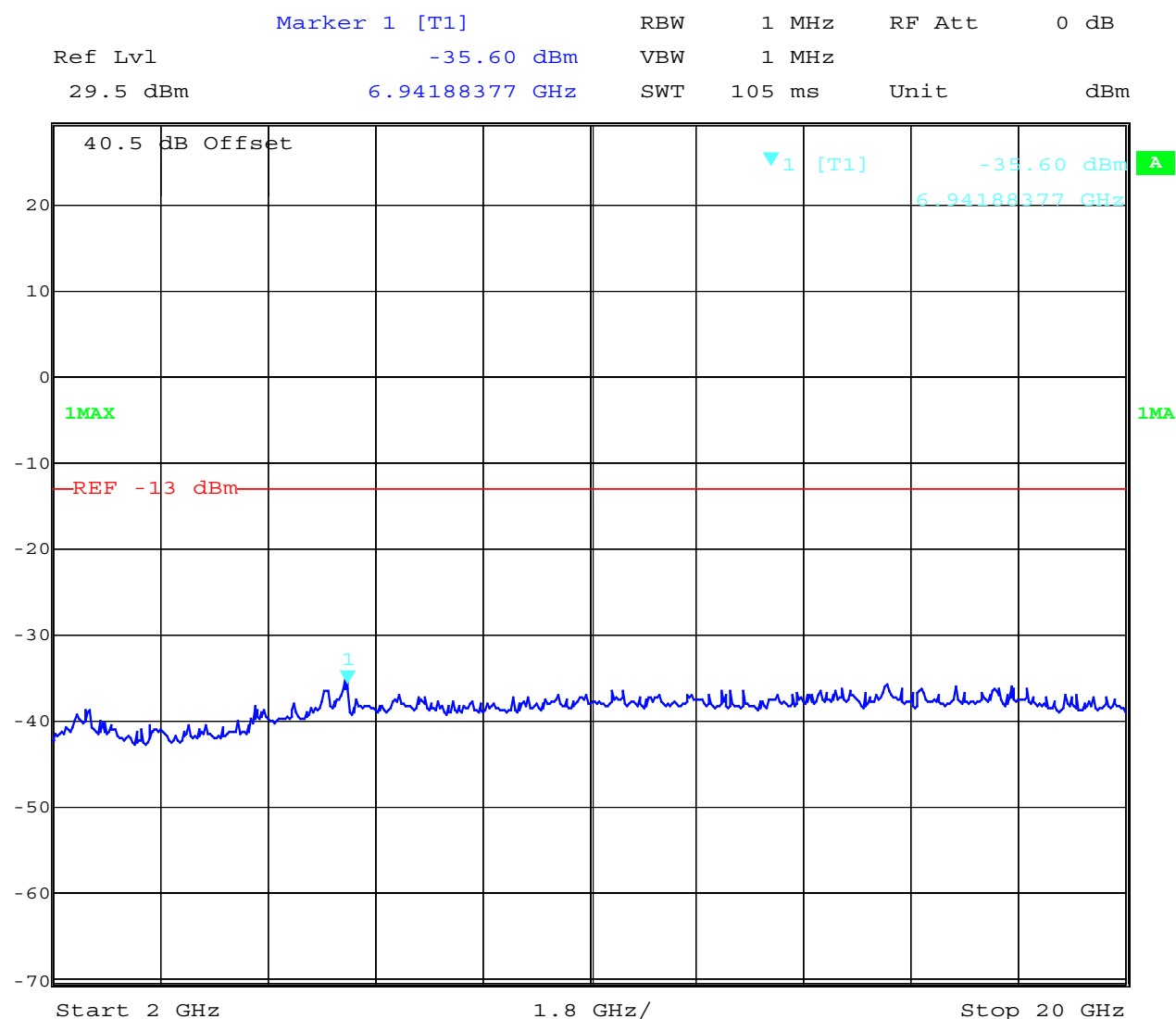
## Channel 512



Date: 31.OCT.2001 10:31:25

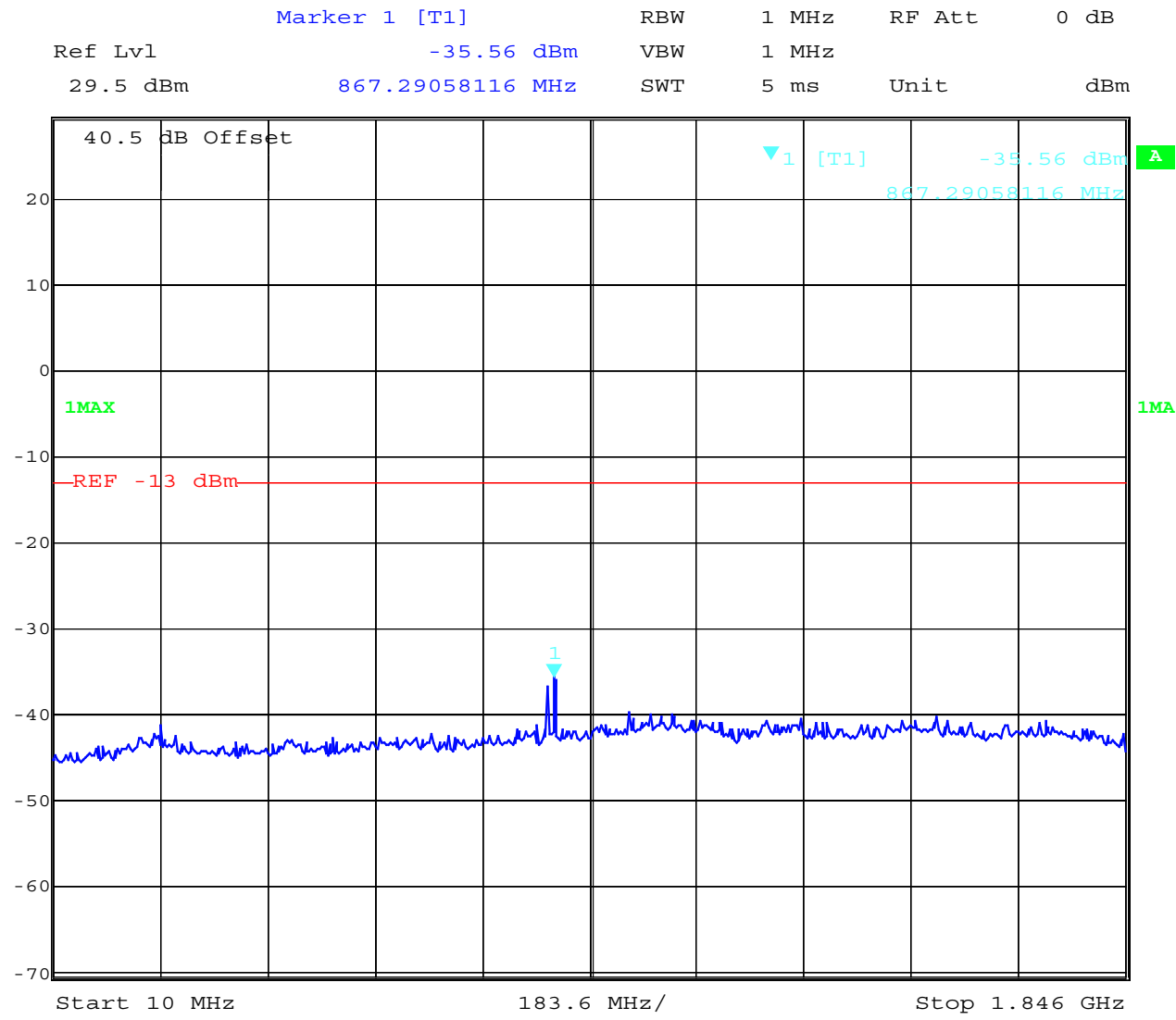
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

Channel 512



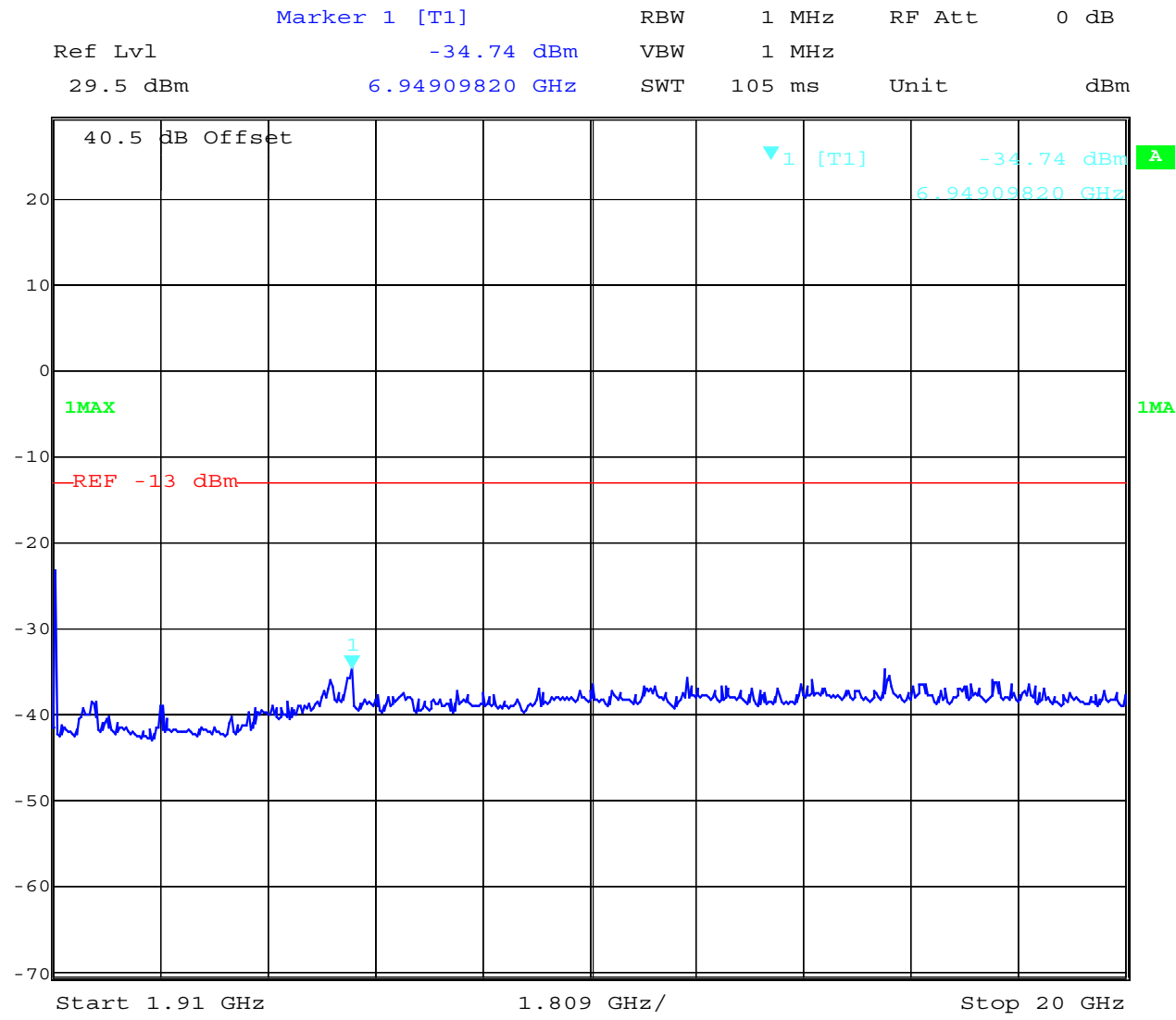
Date:      31.OCT.2001    10:34:03

Channel 661



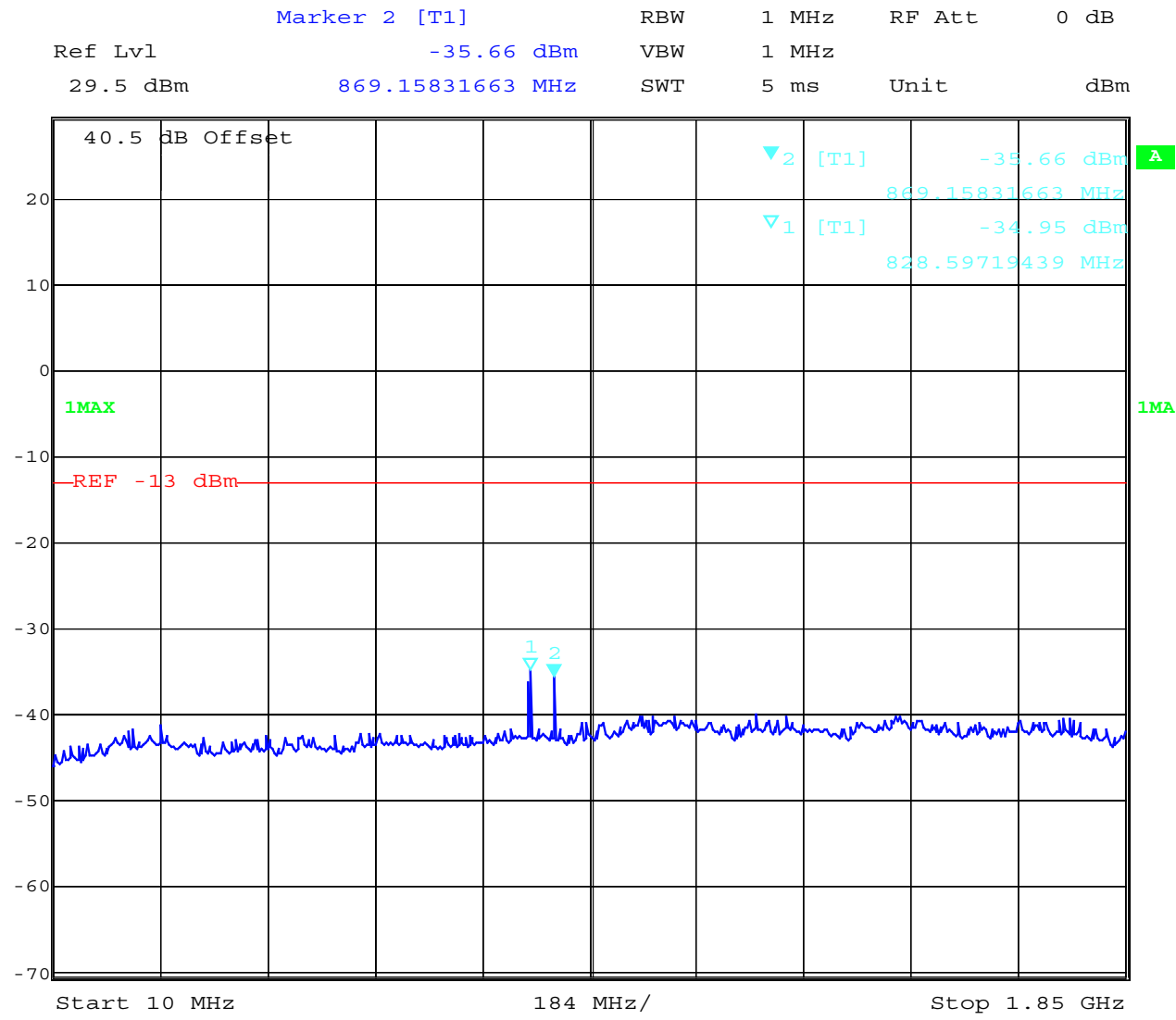
Date:            31.OCT.2001    10:35:46

Channel 661



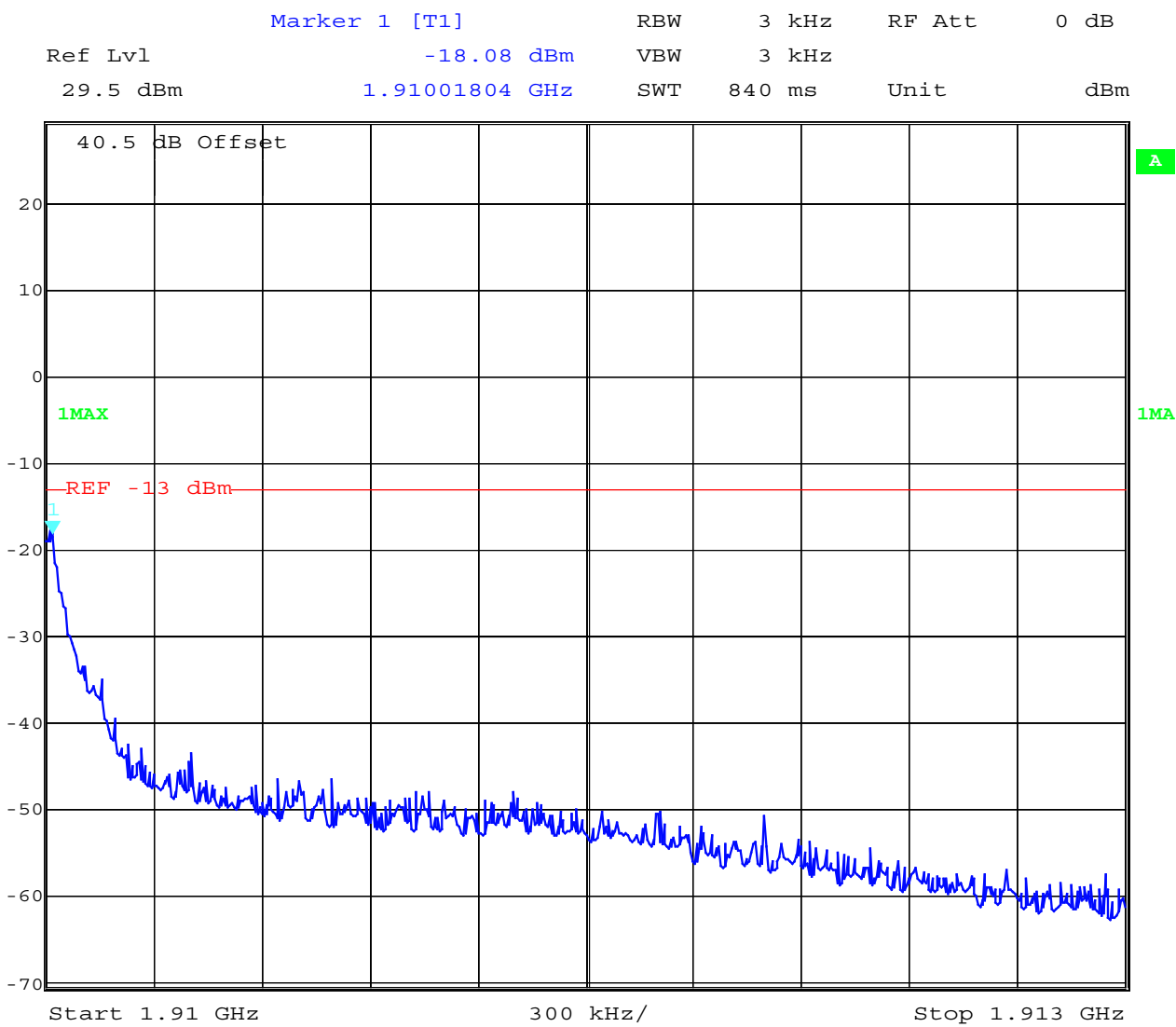
Date:            31.OCT.2001    10:37:16

Channel 810



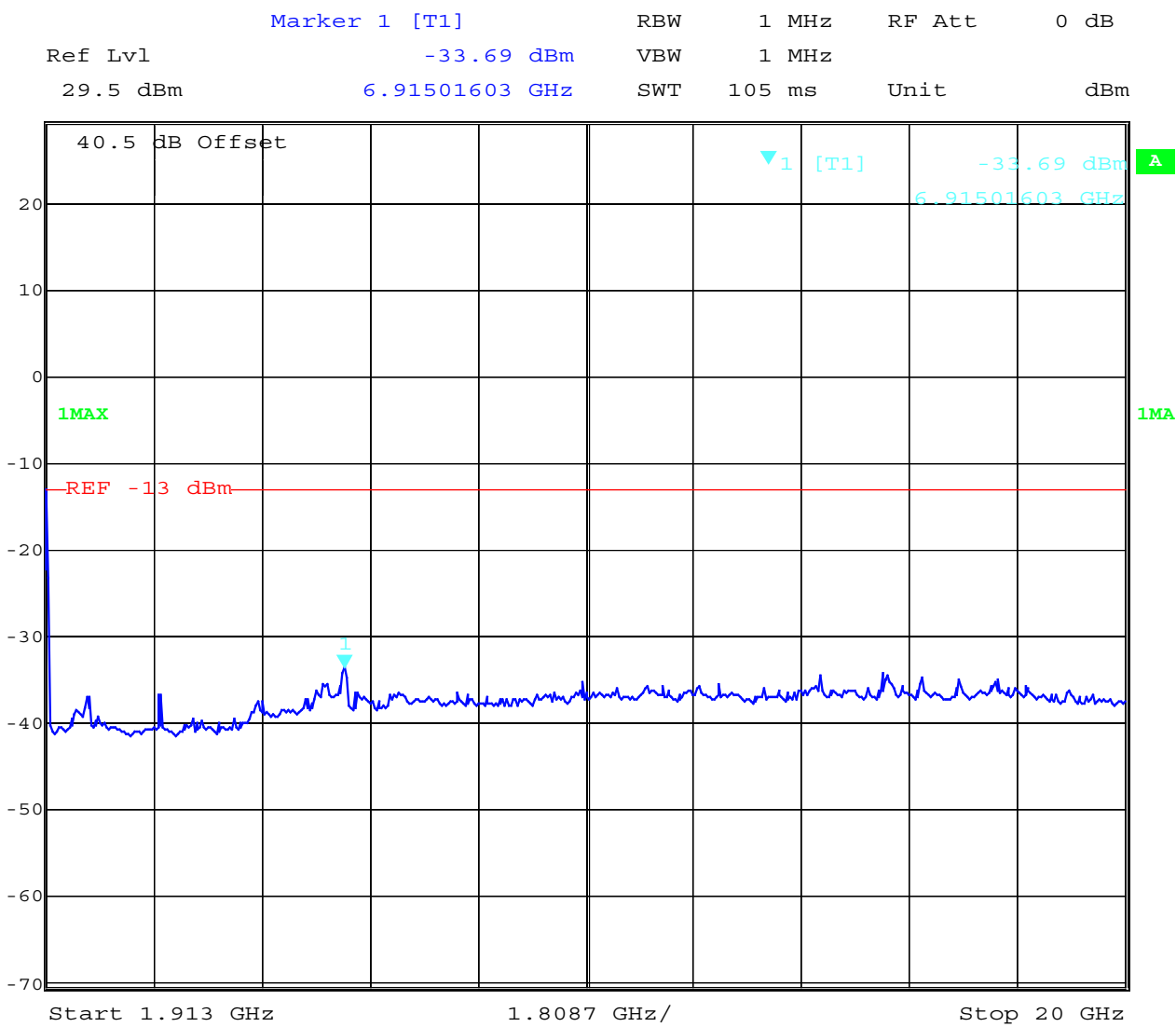
Date:            31.OCT.2001    10:39:07

Channel 810



Date:      31.OCT.2001    10:40:18

Channel 810



Date:            31.OCT.2001    10:49:41

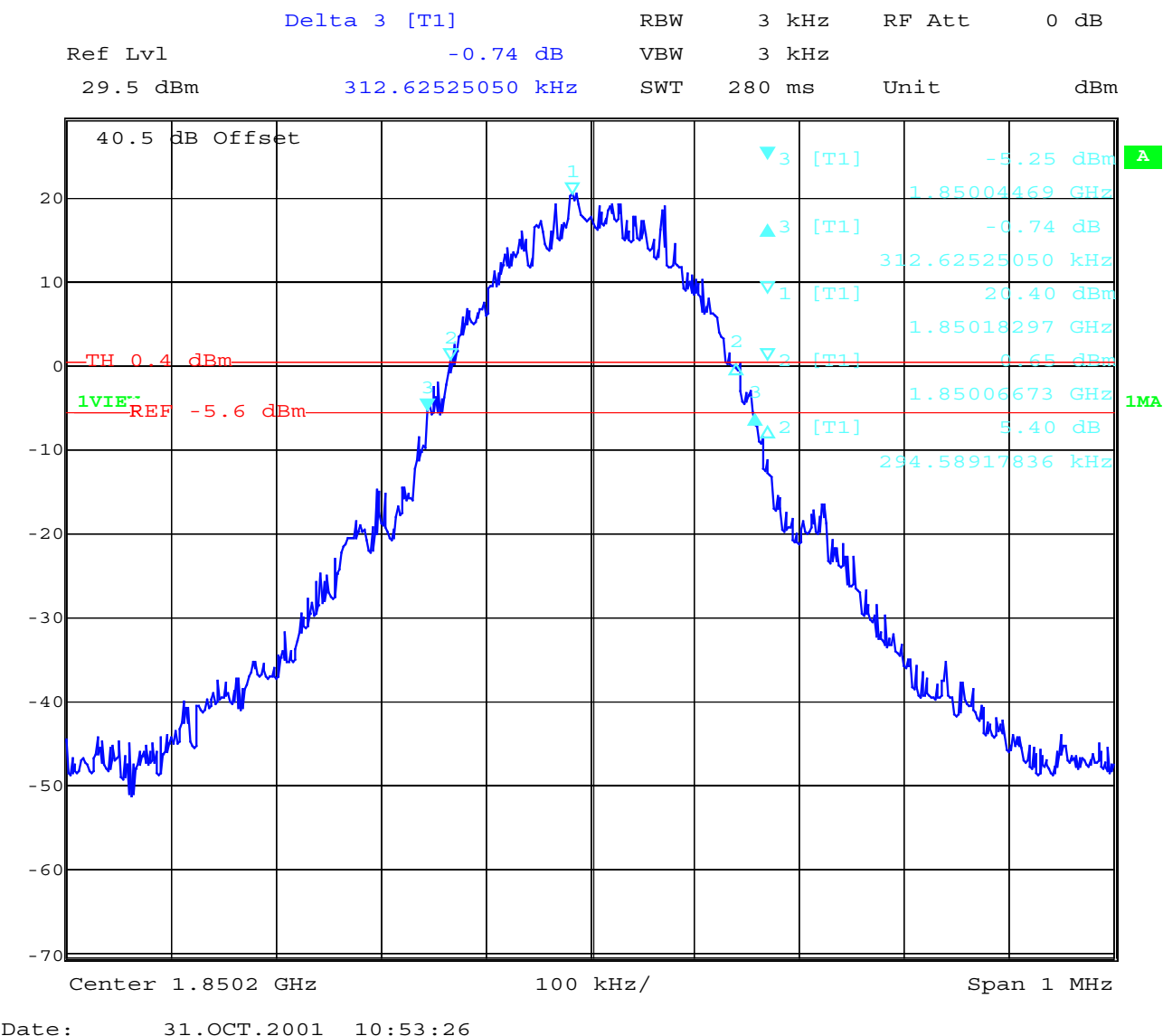
**OCCUPIED BANDWIDTH****\$2.989****Occupied Bandwidth Results**

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 | 294.6 kHz              | 312.6             |
| 1880.0 MHz | 294.6 kHz              | 310.6             |
| 1909.2 MHz | 294.6 kHz              | 312.6             |

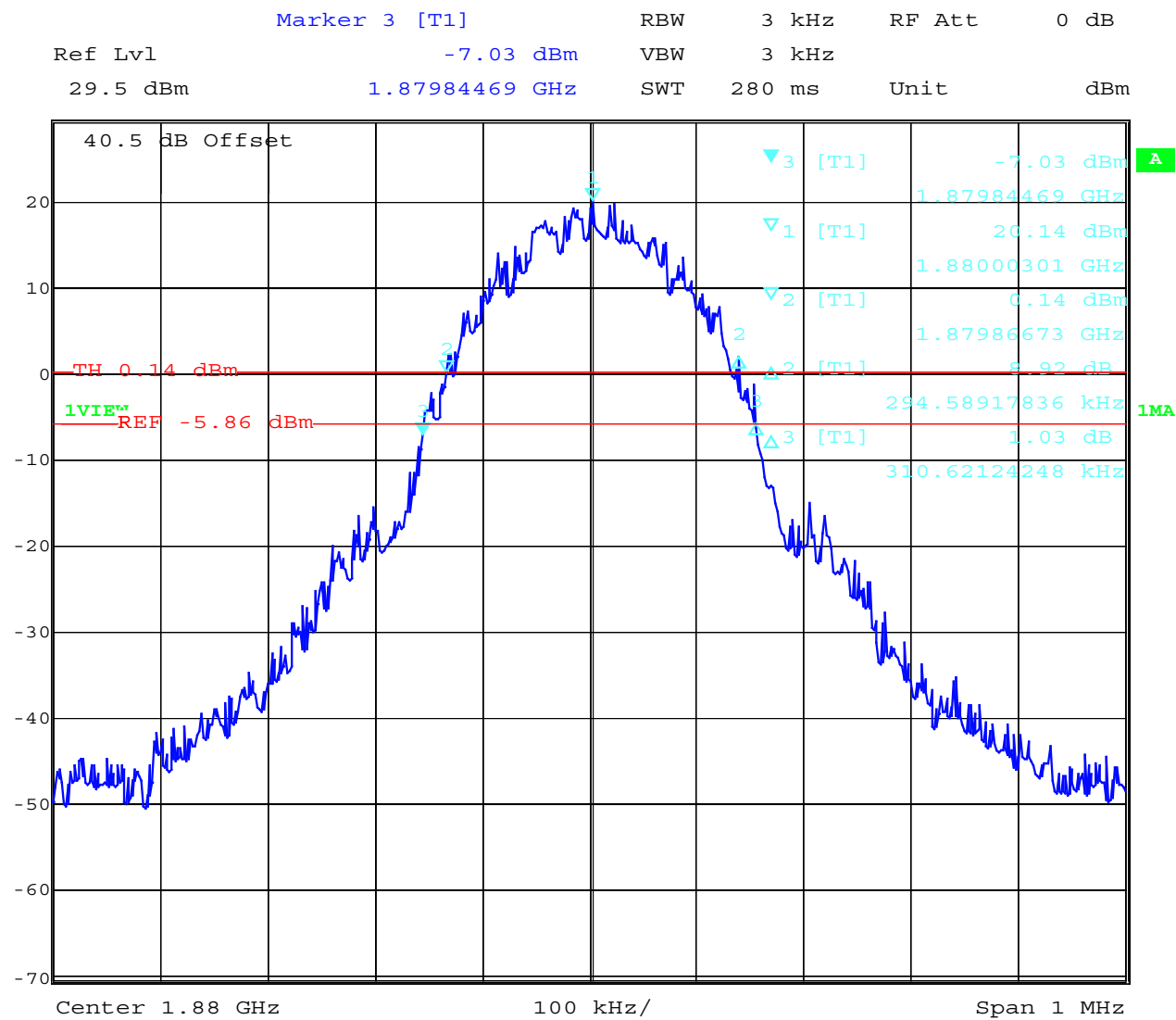
Part 24.238 (a) requires a measurement bandwidth of at least 1% of the occupied bandwidth. For ca. 290 kHz, this equates to a resolution bandwidth of at least 2.96 kHz. For this testing, a resolution bandwidth 3.0 kHz was used.

Channel 512  
99% Occupied Bandwidth and -26 dB BW



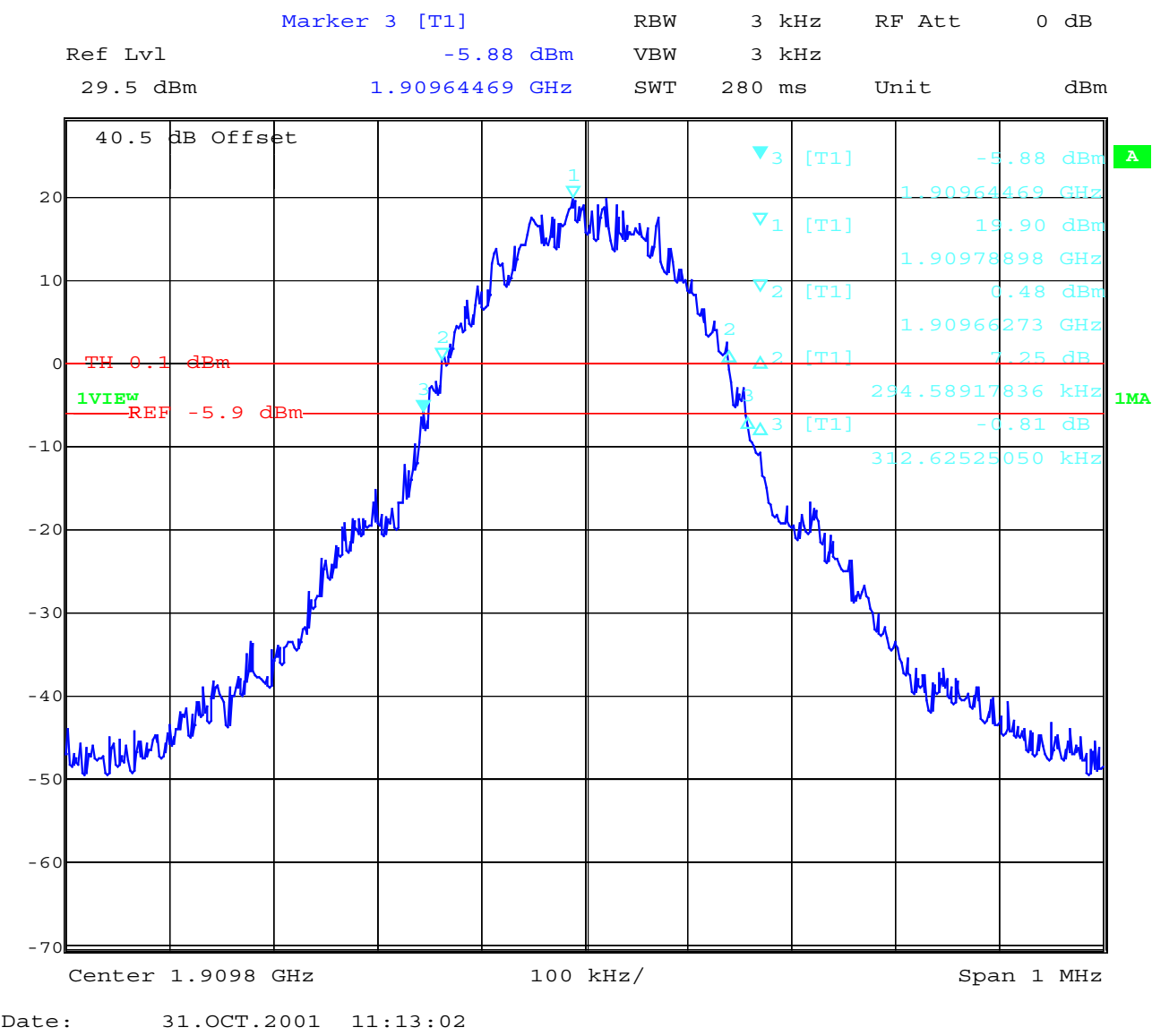
REFERENCE NUMBER(S) OF TEST EQUIPMENT USED  
(for reference numbers see test equipment listing)

Channel 661  
99% Occupied Bandwidth and -26 dB BW



Date:            31.OCT.2001    10:57:12

Channel 810  
99% Occupied Bandwidth and -26 dB BW

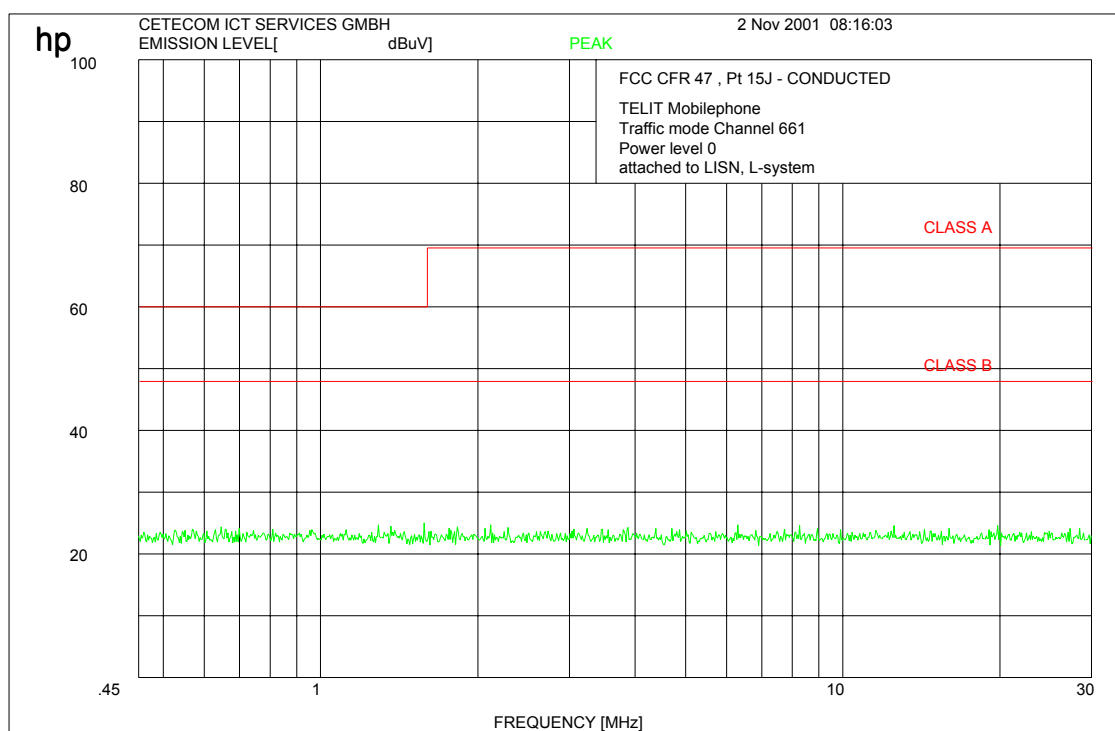


## CONDUCTED EMISSIONS

§ 15.107/207

Measured with AC/DC power adapter at an artificial network.

L-system

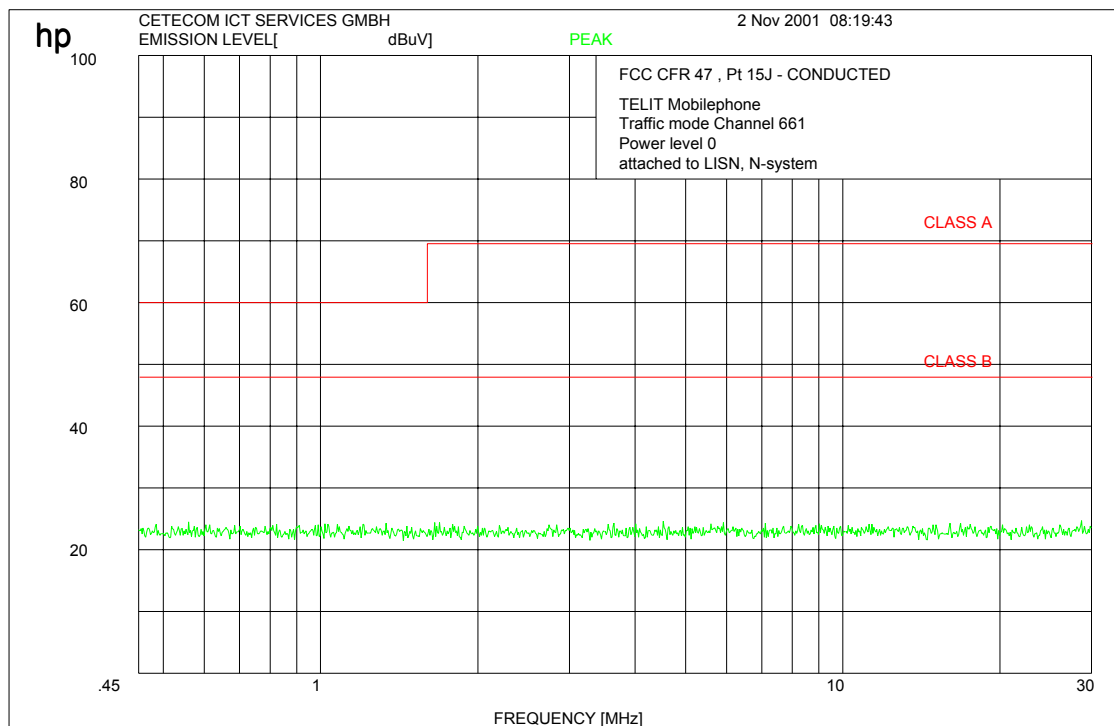


No peaks found

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

52 - 57

N-system



**No peaks found**

Technical specification : 15.107 / 15.207 (Revised as of October 1, 1991 )

Limit

|                |                                |
|----------------|--------------------------------|
| 0.45 to 30 MHz | 250 $\mu$ V / 47.96 dB $\mu$ V |
|----------------|--------------------------------|

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

52 - 57

**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 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 | Funktionsgenerator    | AFGU      | Rohde & Schwarz | 862 480/032 |
| 09 | Regeltrenntrafo       | MPL       | Erfi            | 91350       |
| 10 | Netznachbildung       | NNLA 8120 | Schwarzbeck     | 8120331     |
| 11 | Relais-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 | Modulationsmeter      | 9008      | Racal-Dana      | 2647        |
| 16 | Frequenzzähler        | 5340 A    | Hewlett-Packard | 1532A03899  |
| 17 | Absorber Schirmkabine | ---       | 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 Antenne     | 3104      | Emco            | 3758        |
| 23 | Log. Per. Antenne     | 3146      | Emco            | 2130        |
| 24 | Double Ridge 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 Antenne     | HK 116    | Rohde & Schwarz | 888 945/013 |
| 28 | Log. Per. Antenne     | HL 223    | Rohde & Schwarz | 825 584/002 |
| 29 | Relais-Switch-Unit    | RSU       | Rohde & Schwarz | 375 339/002 |
| 30 | Highpass              | HM985955  | FSY Microwave   | 001         |
| 31 | Amplifier             | P42-GA29  | Tron-Tech       | B 23602     |
| 32 | Absorber Schirmkabine |           | Frankonia       |             |
| 33 | Steuerrechner         | 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 |