

RED-Radio Test Report

For

ASBISc Enterprises PLC

Kids Smartwatch

Model No.: CNE-KW51, CNE-KW51XX(XX could be A-Z)

Prepared For : ASBISc Enterprises PLC
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TEST REPORT

Applicant : ASBISc Enterprises PLC
Manufacturer : ASBISc Enterprises PLC
Product Name : Kids Smartwatch
Model No. : CNE-KW51, CNE-KW51XX(XX could be A-Z)
Trade Mark : Canyon
Rating(s) : Input: DC 5V, 300mA (with DC 3.7V, 420 mAh Battery inside)

Test Standard(s) : ETSI EN301 511 V12.5.1(2017-03)

Test Method(s) : ETSI TS 151 010-1 V13.5.0 (2017-11)

The device described above is tested by Shenzhen Anbotech Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotech Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the ETSI EN301 511 requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotech Compliance Laboratory Limited.

Date of Test

Dec. 20, 2018~ Jan. 15, 2019

Prepared By



Oliay Yang

(Engineer / Oliay Yang)

Reviewer

Snowy Meng

(Supervisor / Snowy Meng)

Approved & Authorized Signer

Sally Zhang

(Manager / Sally Zhang)

1. General Information

1.1. Client Information

| | | |
|--------------|---|---|
| Applicant | : | ASBISc Enterprises PLC |
| Address | : | 43 Kolonakiou street, Diamond Court, 4103, Ayios Athabasilos, Limassol, Cyprius |
| Manufacturer | : | ASBISc Enterprises PLC |
| Address | : | 43 Kolonakiou street, Diamond Court, 4103, Ayios Athabasilos, Limassol, Cyprius |
| Factory | : | Jiangsu JinYiDa Energy Technology Co.,Ltd |
| Address | : | JingKou Industrial Park, JingKou District, Zhenjiang City |

1.2. Description of Device (EUT)

| | | |
|---|----------------------|--|
| Product Name | : | Kids Smartwatch |
| Model No. | : | CNE-KW51, CNE-KW51XX(XX could be A-Z) (Note: All samples are the same except the appearance, so we prepare "CNE-KW51" for test only.) |
| Trade Mark | : | Canyon |
| Test Power Supply | : | DC 3.7V Battery inside |
| Product Description | Operation Frequency: | GSM 900: 880 -915 MHz (TX); 935 - 963 MHz (RX) DCS1800: 1710 -1785 MHz (TX); 1805-1880 MHz (RX) |
| | Modulation Type: | GMSK |
| | Radio Technology | GSM/GPRS (900/1800) |
| | Power Class | GSM900: 4, GSM1800: 1 |
| | Multislot Class | GPRS: 12 |
| | Antenna Type: | PIFA Antenna |
| | Antenna Gain(Peak): | GSM 900: -4 dBi DCS1800: -1 dBi |
| Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual. 2) This report is for GSM. | | |

1.3. Auxiliary Equipment Used During Test

| | | |
|-----|---|--|
| N/A | : | |
|-----|---|--|

1.4 Test Standard Description

ETSI EN 301 511 V12.5.1: Global System for Mobile communications (GSM);

Mobile Stations (MS) equipment; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU.

ETSI TS 151 010-1 V13.5.0: Digital cellular telecommunications system (Phase 2+);

Mobile Station (MS) conformance specification; Part 1: Conformance specification
(ETSI TS 151 010-1 version 13.5.0 Release 12)

1.5 Additional Information

N/A

1.6 Test Conditions

| | | |
|----------------------------|---------------------------------|--|
| Temperature: | 15-35 ° C | |
| Relative humidity content: | Up to 75 % | |
| Details of power supply: | 230 V AC | |
| - Extreme test conditions: | Operating voltage of the mobile | |
| | Vnom= 3.70 V | DC |
| | Vmin = 3.33 V | DC |
| | Vmax = 4.07 V | DC |
| - Extreme temperature: | -20° C / 60° C | |
| Vibration | Frequency | ASD |
| | 5Hz-20Hz | 0,96 m2/s3 |
| | 20 Hz to 500 Hz | 0,96 m2/s3 at 20 Hz, thereafter -3 dB/Octave |
| Other parameter: | None | |

General Test Conditions

| | | | |
|----------|-------|-------|-------|
| GSM900 | LCH | MCH | HCH |
| GPRS900 | 880.2 | 902.6 | 914.8 |
| EGPRS900 | | | |

| | | | |
|-----------|--------|--------|--------|
| DCS1800 | LCH | MCH | HCH |
| GPRS1800 | 1710.2 | 1747.4 | 1784.8 |
| EGPRS1800 | | | |

| | | | | | |
|-------------|----------------|--------------|-----------------|--------------------|------------------|
| VL | VN | VH | TL | TN | TH |
| Low voltage | Normal voltage | High voltage | Low temperature | Normal temperature | High temperature |

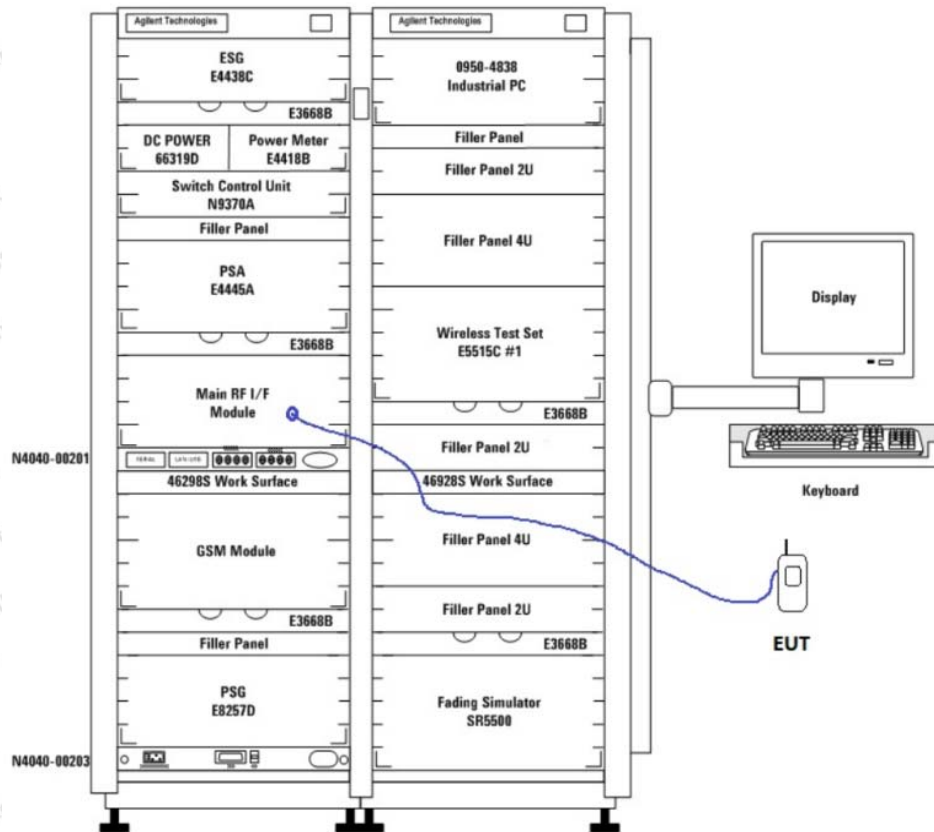
1.7 Measurement Uncertainty (95% confidence levels, k=2)

Maximum measurement uncertainty

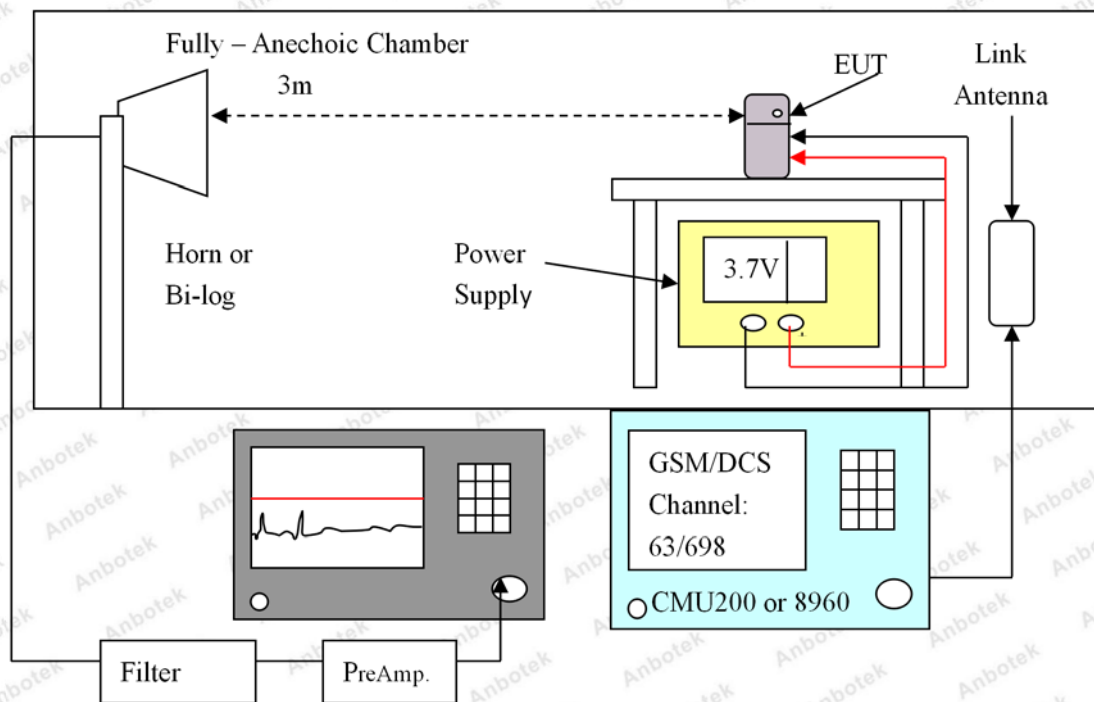
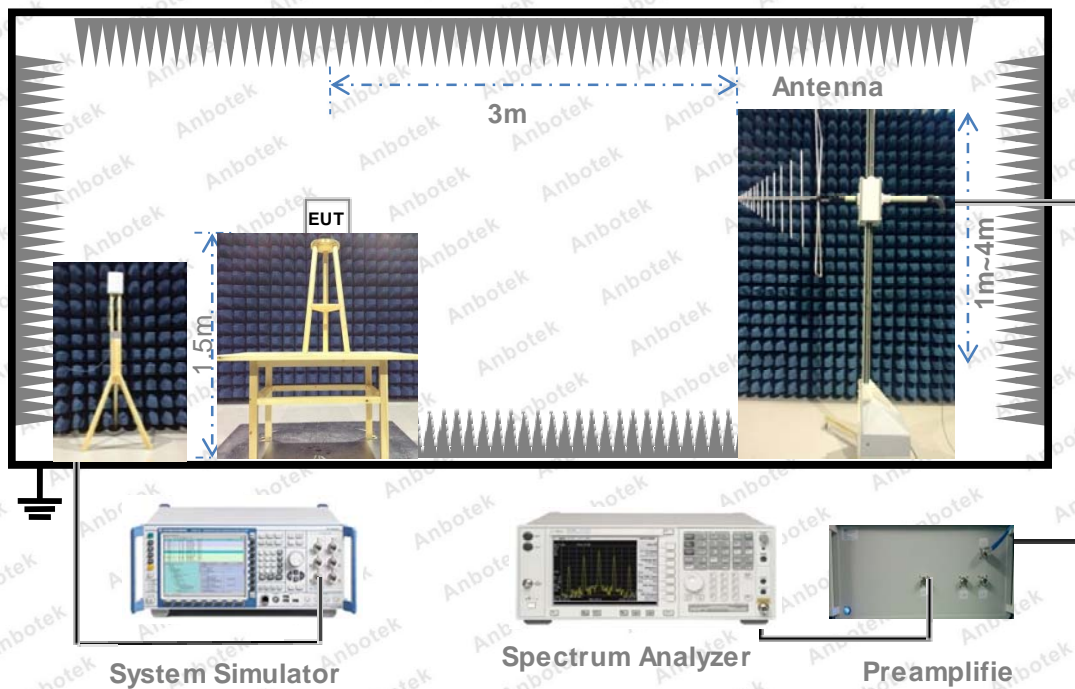
| Parameter | Uncertainty |
|-----------------------------------|-------------|
| Occupied Channel Bandwidth | ±5 % |
| RF output power, conducted | ±1,5 dB |
| Power Spectral Density, conducted | ±3 dB |
| Unwanted Emissions, conducted | ±3 dB |
| All emissions, radiated | ±6 dB |
| Temperature | ±1 °C |
| Humidity | ±5 % |
| DC and low frequency voltages | ±3 % |
| Time | ±5 % |
| Duty Cycle | ±5 % |

1.8 Measurement and Test Setup

1.8.1 Conducted Test Setup



1.8.2 Radiated Test Setup



1.9 Test Equipment List

| Item | Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Cal. Interval |
|------|--|-------------------------|-------------------------------|---------------|---------------|---------------|
| 1. | Spectrum Analysis | Agilent | E4407B | US39390582 | Nov. 05, 2018 | 1 Year |
| 2. | Preamplifier | SKET Electronic | BK1G18G30 D | KD17503 | Nov. 05, 2018 | 1 Year |
| 3. | EMI Test Receiver | Rohde & Schwarz | ESPI3 | 101604 | Nov. 05, 2018 | 1 Year |
| 4. | Double Ridged Horn Antenna | Instruments corporation | GTH-0118 | 351600 | Nov. 19, 2018 | 1 Year |
| 5. | Bilog Broadband Antenna | Schwarzbeck | VULB9163 | VULB 9163-289 | Nov. 19, 2018 | 1 Year |
| 6. | Pre-amplifier | SONOMA | 310N | 186860 | Nov. 05, 2018 | 1 Year |
| 7. | EMI Test Software EZ-EMC | SHURPLE | N/A | N/A | N/A | N/A |
| 8. | MXA Spectrum Analysis | Agilent | N9020A | MY51170037 | Nov. 05, 2018 | 1 Year |
| 9. | MXG RF Vector Signal Generator | Agilent | N5182A | MY48180656 | Nov. 05, 2018 | 1 Year |
| 10. | DC Power Supply | IVYTECH | IV3605 | 1804D360510 | Apr. 02, 2018 | 1 Year |
| 11. | Constant Temperature Humidity Chamber | ZHONGJIAN | ZJ-KHWS80B | N/A | Nov. 01, 2018 | 1 Year |
| 12. | Universal Radio Communication Tester | Rohde & Schwarz | CMU 200 | 117888 | Nov. 05, 2018 | 1 Year |
| 13. | Wideband Radio Communication Tester | Rohde & Schwarz | CMW 500 | 104209 | Nov. 05, 2018 | 1 Year |
| 14. | High-Pass Filter | CDKMV | ZHPF-BM110 0 -4000-0730 | B2015094550 | Nov. 08, 2018 | 1 Year |
| 15. | High-Pass Filter | CDKMV | ZHPF-M3.5 -18G-3834 | 1307006523 | Nov. 05, 2018 | 1 Year |
| 16. | 4 Ch. Simultaneous Sampling 14 Bits 2 MS/s | Agilent | U2531A | TW54063507 | Nov. 05, 2018 | 1 Year |
| 17. | 4 Ch. Simultaneous Sampling 14 Bits 2 MS/s | Agilent | U2531A | TW54063513 | Nov. 05, 2018 | 1 Year |

2. Summary of Test Results

| 3GPP TS 51.010-1 Item | EN 301 511 Reference | TEST DESCRIPTION | GSM 900 | DCS 1800 |
|--------------------------|-------------------------|---|------------|-------------|
| 12.1.1 | 4.2.12 | Conducted spurious emissions - MS allocated a channel | Pass | Pass |
| | | Voltage High | Pass | Pass |
| | | Voltage Low | Pass | Pass |
| 12.1.2 | 4.2.13 | Conducted spurious emissions - MS in idle mode | Pass | Pass |
| | | Voltage High | Pass | Pass |
| | | Voltage Low | Pass | Pass |
| 12.2.1 | 4.2.16 | Radiated spurious emissions - MS allocated a channel | Pass | Pass |
| | | Voltage High | Pass | Pass |
| | | Voltage Low | Pass | Pass |
| 12.2.2 | 4.2.17 | Radiated spurious emissions - MS in idle mode | Pass | Pass |
| | | Voltage High | Pass | Pass |
| | | Voltage Low | Pass | Pass |
| 13.1 | 4.2.1 | Transmitter – Frequency error and phase error | Pass | Pass |
| | | Temperature High, Voltage High | Pass | Pass |
| | | Temperature High, Voltage Low | Pass | Pass |
| | | Temperature Low, Voltage High | Pass | Pass |
| | | Temperature Low, Voltage Low | Pass | Pass |
| | | Vibration (X axis) | Pass | Pass |
| | | Vibration (Y axis) | Pass | Pass |
| 13.2 | 4.2.2 | Vibration (Z axis) | Pass | Pass |
| | | Transmitter – Frequency error under multipath and interference conditions | Pass | Pass |
| | | Temperature High, Voltage High | Pass | Pass |
| | | Temperature High, Voltage Low | Pass | Pass |
| | | Temperature Low, Voltage High | Pass | Pass |
| 13.3.4.1 | 4.2.5 | Temperature Low, Voltage Low | Pass | Pass |
| | | Transmitter output power and burst timing - MS with external antenna | Pass | Pass |
| | | Temperature High, Voltage High | Pass | Pass |
| | | Temperature High, Voltage Low | Pass | Pass |
| | | Temperature Low, Voltage High | Pass | Pass |
| | | Temperature Low, Voltage Low | Pass | Pass |

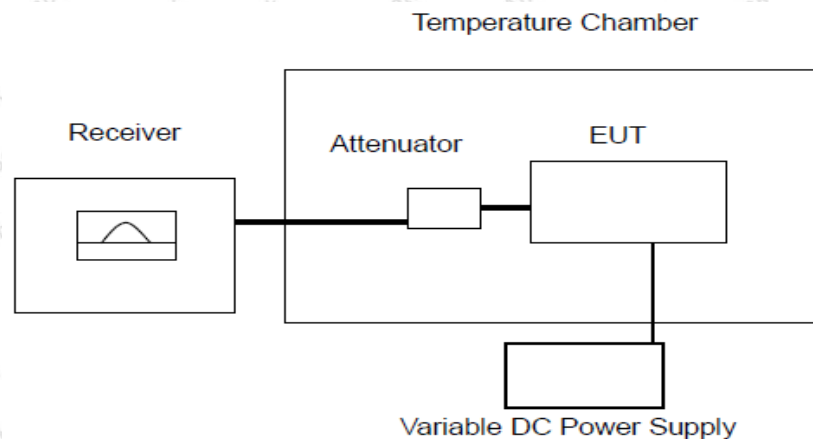
| 3GPP TS 51.010-1 Item | EN 301 511 Reference | TEST DESCRIPTION | GSM 900 | DCS 1800 |
|--------------------------|-------------------------|---|------------|-------------|
| 13.4 | 4.2.6 | Transmitter - Output RF spectrum | Pass | Pass |
| | | Temperature High, Voltage High | Pass | Pass |
| | | Temperature High, Voltage Low | Pass | Pass |
| | | Temperature Low, Voltage High | Pass | Pass |
| | | Temperature Low, Voltage Low | Pass | Pass |
| 13.16.1 | 4.2.4 | Frequency error and phase error in GPRS multislot configuration | Pass | Pass |
| | | Temperature High, Voltage High | Pass | Pass |
| | | Temperature High, Voltage Low | Pass | Pass |
| | | Temperature Low, Voltage High | Pass | Pass |
| | | Temperature Low, Voltage Low | Pass | Pass |
| | | Vibration (X axis) | Pass | Pass |
| | | Vibration (Y axis) | Pass | Pass |
| 13.16.2-1 | 4.2.10 | Transmitter output power in GPRS multislot configuration - MS with external antenna connector | Pass | Pass |
| | | Temperature High, Voltage High | Pass | Pass |
| | | Temperature High, Voltage Low | Pass | Pass |
| | | Temperature Low, Voltage High | Pass | Pass |
| | | Temperature Low, Voltage Low | Pass | Pass |
| 13.16.3 | 4.2.11 | Output RF spectrum in GPRS multislot configuration | Pass | Pass |
| | | Temperature High, Voltage High | Pass | Pass |
| | | Temperature High, Voltage Low | Pass | Pass |
| | | Temperature Low, Voltage High | Pass | Pass |
| | | Temperature Low, Voltage Low | Pass | Pass |
| 14.7.1 | 4.2.20 | Receiver Blocking and spurious response - speech channels | Pass | Pass |
| 13.17.1 | 4.2.22 | Frequency error and Modulation accuracy in EGPRS Configuration | N/A | N/A |
| 13.17.2 | 4.2.23 | Frequency error under multipath and interference conditions in EGPRS Configuration | N/A | N/A |
| 13.17.3 | 4.2.24 | EGPRS Transmitter output power | N/A | N/A |
| 13.17.4 | 4.2.25 | Output RF spectrum in EGPRS configuration | N/A | N/A |
| 14.18.5 | 4.2.26 | Blocking and spurious response in EGPRS configuration | N/A | N/A |

3. Transmitter-Frequency Error and Phase Error

3.1. Test Limit

1. The MS carrier frequency shall be accurate to within 0,1 ppm, or accurate to within 0,1 ppm compared to signals received from the BS. For GSM 400 MS a value of 0,2 ppm shall be used in both cases.
 - 1.1 Under normal conditions; 3GPP TS 05.10, subclause 6.1.
 - 1.2 Under vibration conditions; 3GPP TS 05.10, subclause 6.1; 3GPP TS 05.05, annex D in subclause D.2.3.
 - 1.3 Under extreme conditions; 3GPP TS 05.10, subclause 6.1; 3GPP TS 05.05, subclause 4.4; 3GPP TS 05.05, annex D in subclauses D.2.1 and D.2.2.
2. The RMS phase error (difference between the phase error trajectory and its linear regression on the active part of the time slot) for each burst shall not be greater than 5 degrees.
 - 2.1 Under normal conditions; 3GPP TS 05.05, subclause 4.6.
 - 2.2 Under vibration conditions; 3GPP TS 05.05, subclause 4.6; 3GPP TS 05.05, annex D in subclause D.2.3.
 - 2.3 Under extreme conditions; 3GPP TS 05.05, subclause 4.6; 3GPP TS 05.05, annex D in subclauses D.2.1 and D.2.2.
3. The maximum peak deviation during the useful part of each burst shall not be greater than 20 degrees.
 - 3.1 Under normal conditions; 3GPP TS 05.05, subclause 4.6.
 - 3.2 Under vibration conditions; 3GPP TS 05.05, subclause 4.6; 3GPP TS 05.05, annex D in subclause D.2.3.
 - 3.3 Under extreme conditions; 3GPP TS 05.05, subclause 4.6; 3GPP TS 05.05, annex D in subclauses D.2.1 and D.2.2.

3.2. Test Setup



3.3. Test Procedure

1. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.1.2 for the test conditions.
2. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.1.2 for the measurement method.

3.4. Test Result

| | | | |
|--------------|----------|--------------------|------------------------|
| Temperature: | 25° C | Relative Humidity: | 63 % |
| Pressure: | 1012 hPa | Test Voltage: | DC 3.7V Battery inside |

MS under maximum power control level (5)

| GSM 900 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|----------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| LCH (880.2MHz) | NT/NV | 7 | 88 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 3.0 | 20 | PASS |
| | TL/VL | 8 | 88 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 3.1 | 20 | PASS |
| | TL/VH | 14 | 88 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 3.0 | 20 | PASS |
| | TH/VL | 10 | 88 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 3.0 | 20 | PASS |
| | TH/VH | 14 | 88 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 3.1 | 20 | PASS |
| | Vibration | 10 | 88 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 3.1 | 20 | PASS |

MS under maximum power control level (19)

| GSM 900 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|----------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| LCH (880.2MHz) | NT/NV | 7 | 88 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TL/VL | 12 | 88 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |
| | TL/VH | 13 | 88 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TH/VL | 7 | 88 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |

| | | | | | | | | |
|--|-----------|----|----|------|------|-----|----|------|
| | TH/VH | 5 | 88 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |
| | Vibration | 10 | 88 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |

MS under maximum power control level (5)

| GSM 900 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|-------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| MCH (902.6MHz) | NT/NV | 8 | 90.3 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.9 | 20 | PASS |
| | TL/VL | 14 | 90.3 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 3.0 | 20 | PASS |
| | TL/VH | 17 | 90.3 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 3.0 | 20 | PASS |
| | TH/VL | 10 | 90.3 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.9 | 20 | PASS |
| | TH/VH | 15 | 90.3 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.9 | 20 | PASS |
| | Vibration | 16 | 90.3 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.9 | 20 | PASS |

MS under maximum power control level (19)

| GSM 900 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|-------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| MCH (902.6MHz) | NT/NV | 6 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |
| | TL/VL | 5 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |
| | TL/VH | 16 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |
| | TH/VL | 9 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TH/VH | 11 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | Vibration | 6 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |

MS under maximum power control level (5)

| GSM 900 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|-------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| HCH (914.8MHz) | NT/NV | 6 | 91.5 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TL/VL | 17 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TL/VH | 13 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TH/VL | 13 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |

| | | | | | | | | |
|--|-----------|----|------|------|------|-----|----|------|
| | TH/VH | 14 | 91.5 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | Vibration | 6 | 91.5 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |

MS under maximum power control level (19)

| GSM 900 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|-------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| HCH (914.8MHz) | NT/NV | 8 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TL/VL | 15 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TL/VH | 17 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |
| | TH/VL | 10 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TH/VH | 15 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | Vibration | 13 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |

MS under maximum power control level (0)

| DCS1800 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|--------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| LCH (1710.2MHz) | NT/NV | 8 | 171 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 6.9 | 20 | PASS |
| | TL/VL | -6 | 171 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 7.3 | 20 | PASS |
| | TL/VH | 0 | 171 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 7.2 | 20 | PASS |
| | TH/VL | -2 | 171 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 7.3 | 20 | PASS |
| | TH/VH | 0 | 171 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 7.0 | 20 | PASS |
| | Vibration | 9 | 171 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 7.2 | 20 | PASS |

MS under maximum power control level (15)

| DCS1800 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|--------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| LCH (1710.2MHz) | NT/NV | 11 | 171 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.0 | 20 | PASS |
| | TL/VL | -1 | 171 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.1 | 20 | PASS |
| | TL/VH | -1 | 171 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.0 | 20 | PASS |
| | TH/VL | 2 | 171 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.1 | 20 | PASS |

| | | | | | | | | |
|--|-----------|---|-----|------|------|-----|----|------|
| | TH/VH | 8 | 171 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.0 | 20 | PASS |
| | Vibration | 7 | 171 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.1 | 20 | PASS |

MS under maximum power control level (0)

| DCS1800 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|--------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| MCH (1747.4MHz) | NT/NV | 11 | 174.7 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 6.1 | 20 | PASS |
| | TL/VL | 3 | 174.7 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 6.3 | 20 | PASS |
| | TL/VH | 5 | 174.7 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 6.1 | 20 | PASS |
| | TH/VL | -1 | 174.7 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 6.1 | 20 | PASS |
| | TH/VH | 9 | 174.7 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 6.0 | 20 | PASS |
| | Vibration | -4 | 174.7 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 6.0 | 20 | PASS |

MS under maximum power control level (15)

| DCS1800 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|--------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| MCH (1747.4MHz) | NT/NV | 11 | 174.7 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.1 | 20 | PASS |
| | TL/VL | -1 | 174.7 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.1 | 20 | PASS |
| | TL/VH | 5 | 174.7 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.0 | 20 | PASS |
| | TH/VL | 0 | 174.7 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.2 | 20 | PASS |
| | TH/VH | 9 | 174.7 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.1 | 20 | PASS |
| | Vibration | 1 | 174.7 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.0 | 20 | PASS |

MS under maximum power control level (0)

| DCS1800 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|--------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| HCH (1784.8MHz) | NT/NV | -6 | 178.5 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 3.6 | 20 | PASS |
| | TL/VL | -1 | 178.5 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 3.5 | 20 | PASS |
| | TL/VH | 3 | 178.5 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 3.4 | 20 | PASS |
| | TH/VL | -3 | 178.5 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 3.5 | 20 | PASS |

| | | | | | | | | |
|--|-----------|----|-------|------|------|-----|----|------|
| | TH/VH | 4 | 178.5 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 3.3 | 20 | PASS |
| | Vibration | -4 | 178.5 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 3.2 | 20 | PASS |

MS under maximum power control level (15)

| DCS1800 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|--------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| HCH (1784.8MHz) | NT/NV | -7 | 178.5 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.1 | 20 | PASS |
| | TL/VL | -1 | 178.5 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.1 | 20 | PASS |
| | TL/VH | -2 | 178.5 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.2 | 20 | PASS |
| | TH/VL | 0 | 178.5 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.1 | 20 | PASS |
| | TH/VH | 7 | 178.5 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.2 | 20 | PASS |
| | Vibration | -6 | 178.5 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 2.1 | 20 | PASS |

4. Transmitter - Frequency Error under Multipath and Interference Conditions

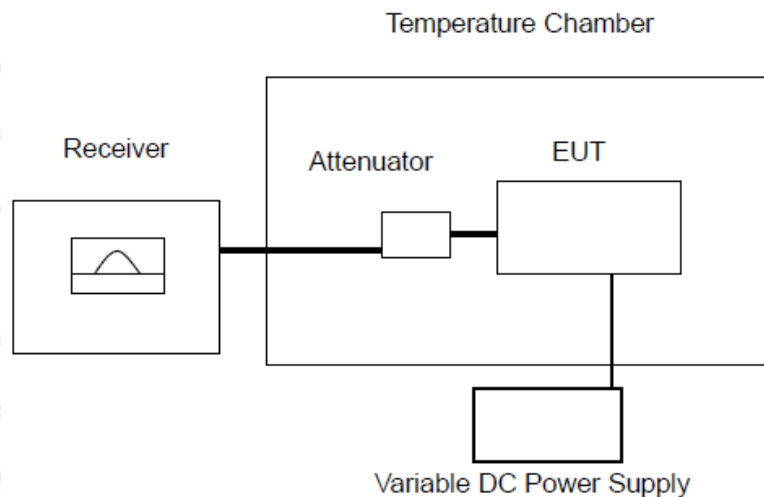
4.1. Test Limit

The frequency error, with reference to the SS carrier frequency as measured in repeats of step e), for each measured burst shall be less than the values shown in tables 13-1a and 13-1b

Requirements for frequency error under multipath,
Doppler shift and interference conditions

| T-GSM 810, GSM 850 and GSM 900 | | DCS 1 800 | | PCS 1 900 | |
|--------------------------------|---------------------------|-----------------------|---------------------------|-----------------------|---------------------------|
| Propagation condition | Permitted frequency error | Propagation condition | Permitted frequency error | Propagation condition | Permitted frequency error |
| RA250 | ±300 Hz | RA130 | ±400 Hz | RA130 | ±420 Hz |
| HT100 | ±180 Hz | HT100 | ±350 Hz | HT100 | ±370 Hz |
| TU50 | ±160 Hz | TU50 | ±260 Hz | TU50 | ±280 Hz |
| TU3 | ±230 Hz | TU1,5 | ±320 Hz | TU1,5 | ±330 Hz |

4.2. Test Setup



4.3. Test Procedure

1. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.2.3 for the test conditions.
2. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.2.4 for the measurement method.

4.4. Test Result

| | | | |
|--------------|----------|--------------------|------------------------|
| Temperature: | 24.9° C | Relative Humidity: | 65 % |
| Pressure: | 1012 hPa | Test Voltage: | DC 3.7V Battery inside |

| Fading set | Test conditions | Power control LEVEL | Result | | | | |
|------------|-----------------|---------------------|--------|-----|-----|-------|--------|
| | | | GSM900 | | | | |
| | | | ARFCN | | | | |
| | | | LCH | MCH | HCH | Limit | Result |
| RA250 | NT/NV | 5 | 3 | 9 | 16 | ±300 | PASS |
| | | 19 | 4 | 9 | 12 | ±300 | PASS |
| | TL/VL | 5 | 11 | 14 | 14 | ±300 | PASS |
| | | 19 | 11 | 12 | 12 | ±300 | PASS |
| | TL/VH | 5 | 6 | 19 | 16 | ±300 | PASS |
| | | 19 | 5 | 12 | 18 | ±300 | PASS |
| | TH/VL | 5 | 14 | 9 | 5 | ±300 | PASS |
| | | 19 | 13 | 13 | 6 | ±300 | PASS |
| | TH/VH | 5 | 13 | 15 | 15 | ±300 | PASS |
| | | 19 | 12 | 14 | 11 | ±300 | PASS |
| HT100 | NT/NV | 5 | 6 | 11 | 15 | ±180 | PASS |
| | | 19 | 4 | 11 | 15 | ±180 | PASS |
| | TL/VL | 5 | 13 | 16 | 15 | ±180 | PASS |
| | | 19 | 12 | 6 | 5 | ±180 | PASS |
| | TL/VH | 5 | 6 | 15 | 15 | ±180 | PASS |
| | | 19 | 7 | 13 | 18 | ±180 | PASS |
| | TH/VL | 5 | 10 | 7 | 12 | ±180 | PASS |
| | | 19 | 12 | 3 | 11 | ±180 | PASS |
| | TH/VH | 5 | 12 | 18 | 7 | ±180 | PASS |
| | | 19 | 10 | 7 | 3 | ±180 | PASS |
| TU50 | NT/NV | 5 | 6 | 15 | 7 | ±163 | PASS |
| | | 19 | 4 | 15 | 13 | ±163 | PASS |
| | TL/VL | 5 | 17 | 8 | 4 | ±163 | PASS |
| | | 19 | 13 | 16 | 4 | ±163 | PASS |
| | TL/VH | 5 | 12 | 14 | 11 | ±163 | PASS |
| | | 19 | 10 | 13 | 8 | ±163 | PASS |
| | TH/VL | 5 | 8 | 6 | 8 | ±163 | PASS |
| | | 19 | 11 | 7 | 7 | ±163 | PASS |
| | TH/VH | 5 | 10 | 13 | 4 | ±163 | PASS |
| | | 19 | 11 | 15 | 6 | ±163 | PASS |
| TU3 | NT/NV | 5 | 7 | 18 | 14 | ±230 | PASS |

| | | | | | | | |
|--|-------|----|----|----|----|------|------|
| | TL/VL | 19 | 3 | 13 | 15 | ±230 | PASS |
| | | 5 | 20 | 14 | 7 | ±230 | PASS |
| | | 19 | 11 | 13 | 7 | ±230 | PASS |
| | TL/VH | 5 | 14 | 14 | 4 | ±230 | PASS |
| | | 19 | 15 | 14 | 13 | ±230 | PASS |
| | TH/VL | 5 | 7 | 5 | 14 | ±230 | PASS |
| | | 19 | 17 | 3 | 11 | ±230 | PASS |
| | TH/VH | 5 | 11 | 18 | 7 | ±230 | PASS |
| | | 19 | 11 | 9 | 3 | ±230 | PASS |

| Fading set | Test conditions | Power control LEVEL | Result | | | | |
|------------|-----------------|---------------------|---------|-----|-----|-------|--------|
| | | | GSM1800 | | | | |
| | | | ARFCN | | | | |
| | | | LCH | MCH | HCH | Limit | Result |
| RA130 | NT/NV | 0 | -1 | 7 | -3 | ±400 | PASS |
| | | 15 | 4 | 8 | -2 | ±400 | PASS |
| | TL/VL | 0 | 7 | 3 | 0 | ±400 | PASS |
| | | 15 | 8 | 3 | 0 | ±400 | PASS |
| | TL/VH | 0 | 10 | -2 | 2 | ±400 | PASS |
| | | 15 | 0 | -3 | 2 | ±400 | PASS |
| | TH/VL | 0 | 2 | -2 | 0 | ±400 | PASS |
| | | 15 | 8 | -1 | -1 | ±400 | PASS |
| | TH/VH | 0 | 1 | 0 | 6 | ±400 | PASS |
| | | 15 | 4 | -1 | 6 | ±400 | PASS |
| HT100 | NT/NV | 0 | -2 | 4 | 2 | ±350 | PASS |
| | | 15 | 0 | -2 | -3 | ±350 | PASS |
| | TL/VL | 0 | 8 | -2 | 3 | ±350 | PASS |
| | | 15 | 6 | 1 | 4 | ±350 | PASS |
| | TL/VH | 0 | 3 | -2 | 5 | ±350 | PASS |
| | | 15 | -4 | 0 | 9 | ±350 | PASS |
| | TH/VL | 0 | -1 | -4 | 5 | ±350 | PASS |
| | | 15 | 10 | -6 | 6 | ±350 | PASS |
| | TH/VH | 0 | -3 | -4 | 3 | ±350 | PASS |
| | | 15 | -1 | 4 | -2 | ±350 | PASS |
| TU50 | NT/NV | 0 | 2 | 4 | -5 | ±263 | PASS |

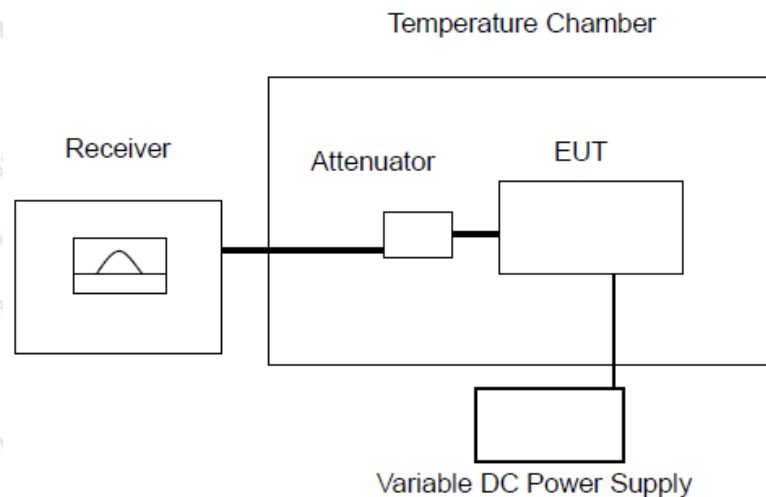
| | | | | | | | |
|-------|-------|----|----|----|----|------|------|
| | TL/VL | 15 | 3 | -1 | -2 | ±263 | PASS |
| | | 0 | 17 | -6 | 3 | ±263 | PASS |
| | TL/VH | 15 | 11 | -2 | 4 | ±263 | PASS |
| | | 0 | -3 | 4 | 5 | ±263 | PASS |
| | TH/VL | 15 | -2 | 6 | -3 | ±263 | PASS |
| | | 0 | 3 | -4 | -1 | ±263 | PASS |
| | TH/VH | 15 | 6 | -4 | 4 | ±263 | PASS |
| | | 0 | -2 | 4 | 6 | ±263 | PASS |
| TU1.5 | NT/NV | 15 | -2 | 4 | -3 | ±263 | PASS |
| | | 0 | 6 | -1 | -2 | ±320 | PASS |
| | TL/VL | 15 | 7 | -4 | -1 | ±320 | PASS |
| | | 0 | 9 | 5 | -2 | ±320 | PASS |
| | TL/VH | 15 | 7 | -1 | 4 | ±320 | PASS |
| | | 0 | -1 | 2 | -7 | ±320 | PASS |
| | TH/VL | 15 | -4 | 2 | -2 | ±320 | PASS |
| | | 0 | 9 | -3 | 5 | ±320 | PASS |
| | TH/VH | 15 | 0 | 0 | 3 | ±320 | PASS |
| | | 0 | 1 | 3 | -1 | ±320 | PASS |
| | | 15 | 0 | 4 | -2 | ±320 | PASS |
| | | | | | | | |

5. Frequency Error and Phase Error in GPRS Multislot Configuration

5.1. Test Limit

1. For all measured bursts, the frequency error, derived in step c.6), shall be less than $10E-7$
2. For all measured bursts, the RMS phase error, derived in step c.8), shall not exceed 5 degrees.
3. For all measured bursts, each individual phase error, derived in step c.7), shall not exceed 20 degrees

5.2. Test Setup



5.3. Test Procedure

1. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.16.1.2 for the test conditions.
2. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.16.1.3 for the measurement method.

5.4. Test Result

| | | | |
|--------------|----------|--------------------|------------------------|
| Temperature: | 25° C | Relative Humidity: | 63 % |
| Pressure: | 1012 hPa | Test Voltage: | DC 3.7V Battery inside |

MS under maximum power control level (5)

| GSM 900 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|----------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| LCH (880.2MHz) | NT/NV | 13 | 88 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 1.7 | 20 | PASS |
| | TL/VL | 11 | 88 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 1.7 | 20 | PASS |
| | TL/VH | 13 | 88 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.7 | 20 | PASS |
| | TH/VL | 13 | 88 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 1.7 | 20 | PASS |
| | TH/VH | 12 | 88 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.7 | 20 | PASS |
| | Vibration | 14 | 88 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.7 | 20 | PASS |

MS under maximum power control level (19)

| GSM 900 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|----------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| LCH (880.2MHz) | NT/NV | 12 | 88 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |
| | TL/VL | 11 | 88 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |
| | TL/VH | 13 | 88 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |
| | TH/VL | 14 | 88 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |
| | TH/VH | 12 | 88 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |

| | | | | | | | | |
|--|-----------|----|----|------|------|-----|----|------|
| | | | | | Peak | 1.5 | 20 | PASS |
| | Vibration | 10 | 88 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |

MS under maximum power control level (5)

| GSM 900 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|-------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| MCH (902.6MHz) | NT/NV | 13 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TL/VL | 12 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TL/VH | 14 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TH/VL | 12 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TH/VH | 11 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.7 | 20 | PASS |
| | Vibration | 12 | 90.3 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 1.7 | 20 | PASS |

MS under maximum power control level (19)

| GSM 900 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|-------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| MCH (902.6MHz) | NT/NV | 13 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |
| | TL/VL | 14 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |
| | TL/VH | 13 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TH/VL | 13 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TH/VH | 12 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |
| | Vibration | 11 | 90.3 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |

MS under maximum power control level (5)

| GSM 900 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|-------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| HCH (914.8MHz) | NT/NV | 11 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.7 | 20 | PASS |
| | TL/VL | 12 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.7 | 20 | PASS |
| | TL/VH | 12 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TH/VL | 12 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.7 | 20 | PASS |
| | TH/VH | 11 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | Vibration | 12 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |

MS under maximum power control level (19)

| GSM 900 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|-------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| HCH (914.8MHz) | NT/NV | 13 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TL/VL | 11 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |
| | TL/VH | 10 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |
| | TH/VL | 11 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.5 | 20 | PASS |
| | TH/VH | 10 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | RMS | 0.5 | 5 | PASS |

| | | | | | | | | |
|--|-----------|----|------|------|------|-----|----|------|
| | | | | | Peak | 1.6 | 20 | PASS |
| | Vibration | 13 | 91.5 | PASS | RMS | 0.5 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |

MS under maximum power control level (0)

| DCS1800 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|--------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| LCH (1710.2MHz) | NT/NV | 0 | 171 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 2.0 | 20 | PASS |
| | TL/VL | -2 | 171 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 1.8 | 20 | PASS |
| | TL/VH | -2 | 171 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 1.8 | 20 | PASS |
| | TH/VL | -1 | 171 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 1.8 | 20 | PASS |
| | TH/VH | -1 | 171 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 1.7 | 20 | PASS |
| | Vibration | 2 | 171 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 7.2 | 20 | PASS |

MS under maximum power control level (15)

| DCS1800 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|--------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| LCH (1710.2MHz) | NT/NV | 0 | 171 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 1.7 | 20 | PASS |
| | TL/VL | -1 | 171 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 2.0 | 20 | PASS |
| | TL/VH | -2 | 171 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 1.8 | 20 | PASS |
| | TH/VL | 0 | 171 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 1.8 | 20 | PASS |
| | TH/VH | 1 | 171 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 1.8 | 20 | PASS |
| | Vibration | -1 | 171 | PASS | RMS | 0.6 | 5 | PASS |
| | | | | | Peak | 1.6 | 20 | PASS |

MS under maximum power control level (0)

| DCS1800 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|--------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| MCH (1747.4MHz) | NT/NV | -1 | 174.7 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 1.7 | 20 | PASS |
| | TL/VL | -2 | 174.7 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 1.9 | 20 | PASS |
| | TL/VH | 0 | 174.7 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 1.8 | 20 | PASS |
| | TH/VL | -1 | 174.7 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 1.9 | 20 | PASS |

| | | | | | | | | |
|--|-----------|---|-------|------|------|-----|----|------|
| | TH/VH | 1 | 174.7 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 1.9 | 20 | PASS |
| | Vibration | 1 | 174.7 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 1.8 | 20 | PASS |

MS under maximum power control level (15)

| DCS1800 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|--------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| MCH (1747.4MHz) | NT/NV | 5 | 174.7 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 1.8 | 20 | PASS |
| | TL/VL | -2 | 174.7 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 1.8 | 20 | PASS |
| | TL/VH | 2 | 174.7 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 1.9 | 20 | PASS |
| | TH/VL | 5 | 174.7 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 1.8 | 20 | PASS |
| | TH/VH | 5 | 174.7 | PASS | RMS | 0.7 | 5 | PASS |
| | | | | | Peak | 1.8 | 20 | PASS |
| | Vibration | 3 | 174.7 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 1.9 | 20 | PASS |

MS under maximum power control level (0)

| DCS1800 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|--------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| HCH (1784.8MHz) | NT/NV | 5 | 178.5 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 1.9 | 20 | PASS |
| | TL/VL | 1 | 178.5 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 2.0 | 20 | PASS |

| | | | | | | | | |
|--|-----------|---|-------|------|------|-----|----|------|
| | TL/VH | 4 | 178.5 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 2.0 | 20 | PASS |
| | TH/VL | 5 | 178.5 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 1.9 | 20 | PASS |
| | TH/VH | 4 | 178.5 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 2.0 | 20 | PASS |
| | Vibration | 7 | 178.5 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 1.9 | 20 | PASS |

MS under maximum power control level (15)

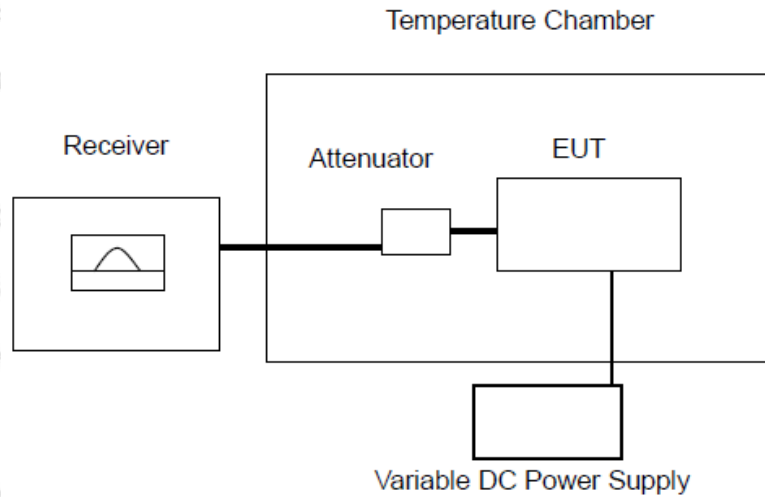
| DCS1800 | Test Condition | Frequency Error (Hz) | Limit (Hz) | Result | Phase Error (deg) | | Limit (deg) | Result |
|--------------------|----------------|----------------------|------------|--------|-------------------|-----|-------------|--------|
| HCH (1784.8MHz) | NT/NV | 8 | 178.5 | PASS | RMS | 0.9 | 5 | PASS |
| | | | | | Peak | 2.1 | 20 | PASS |
| | TL/VL | 7 | 178.5 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 2.0 | 20 | PASS |
| | TL/VH | 7 | 178.5 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 1.9 | 20 | PASS |
| | TH/VL | 6 | 178.5 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 1.9 | 20 | PASS |
| | TH/VH | 5 | 178.5 | PASS | RMS | 0.9 | 5 | PASS |
| | | | | | Peak | 2.1 | 20 | PASS |
| | Vibration | 6 | 178.5 | PASS | RMS | 0.8 | 5 | PASS |
| | | | | | Peak | 1.9 | 20 | PASS |

6. Transmitter Output Power and Burst Timing

6.1. Test Limit

Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.3.5

6.2. Test Setup



6.3. Test Procedure

1. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.3.3 for the test conditions.
2. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.3.4 for the measurement method

6.4. Test Result

| | | | |
|--------------|----------|--------------------|------------------------|
| Temperature: | 25° C | Relative Humidity: | 63 % |
| Pressure: | 1012 hPa | Test Voltage: | DC 3.7V Battery inside |

NT/NV Condition:

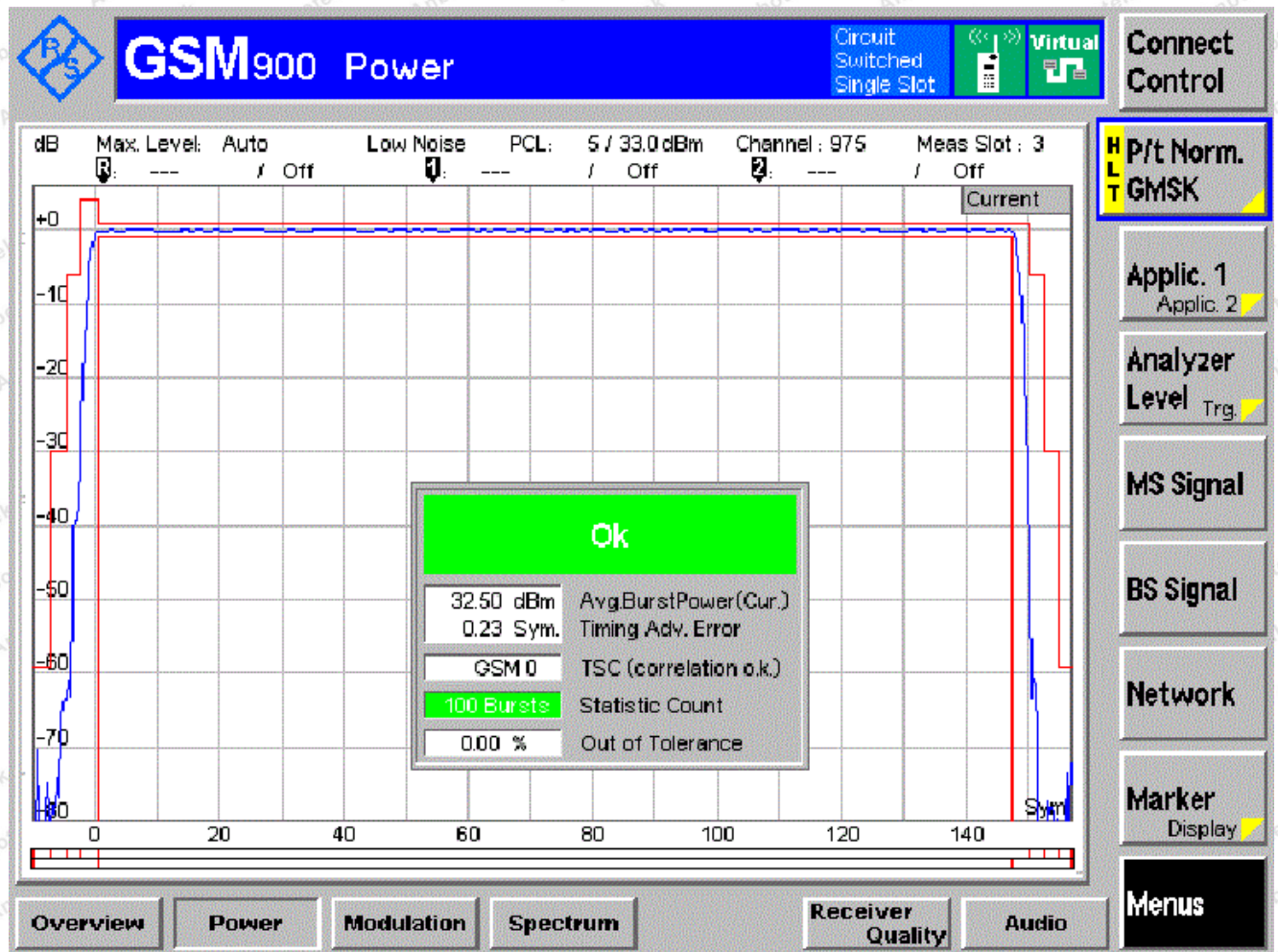
| Transmitter Output power(dBm) | Power level | Result | | | |
|-------------------------------|-------------|------------------|-------|-------|--------|
| | | Traffic Channels | | | |
| GSM900 | | LCH | MCH | HCH | Result |
| TN/VN | 5 | 32.50 | 32.60 | 32.99 | PASS |
| | 12 | 17.80 | 18.12 | 18.00 | PASS |
| | 19 | 4.46 | 4.35 | 4.66 | PASS |

| Transmitter Output power(dBm) | Power level | Result | | | |
|-------------------------------|-------------|------------------|-------|-------|--------|
| | | Traffic Channels | | | |
| DCS1800 | | LCH | MCH | HCH | Result |
| TN/VN | 0 | 28.85 | 28.60 | 28.77 | PASS |
| | 8 | 12.74 | 12.29 | 12.74 | PASS |
| | 15 | -0.55 | -0.99 | -0.48 | PASS |

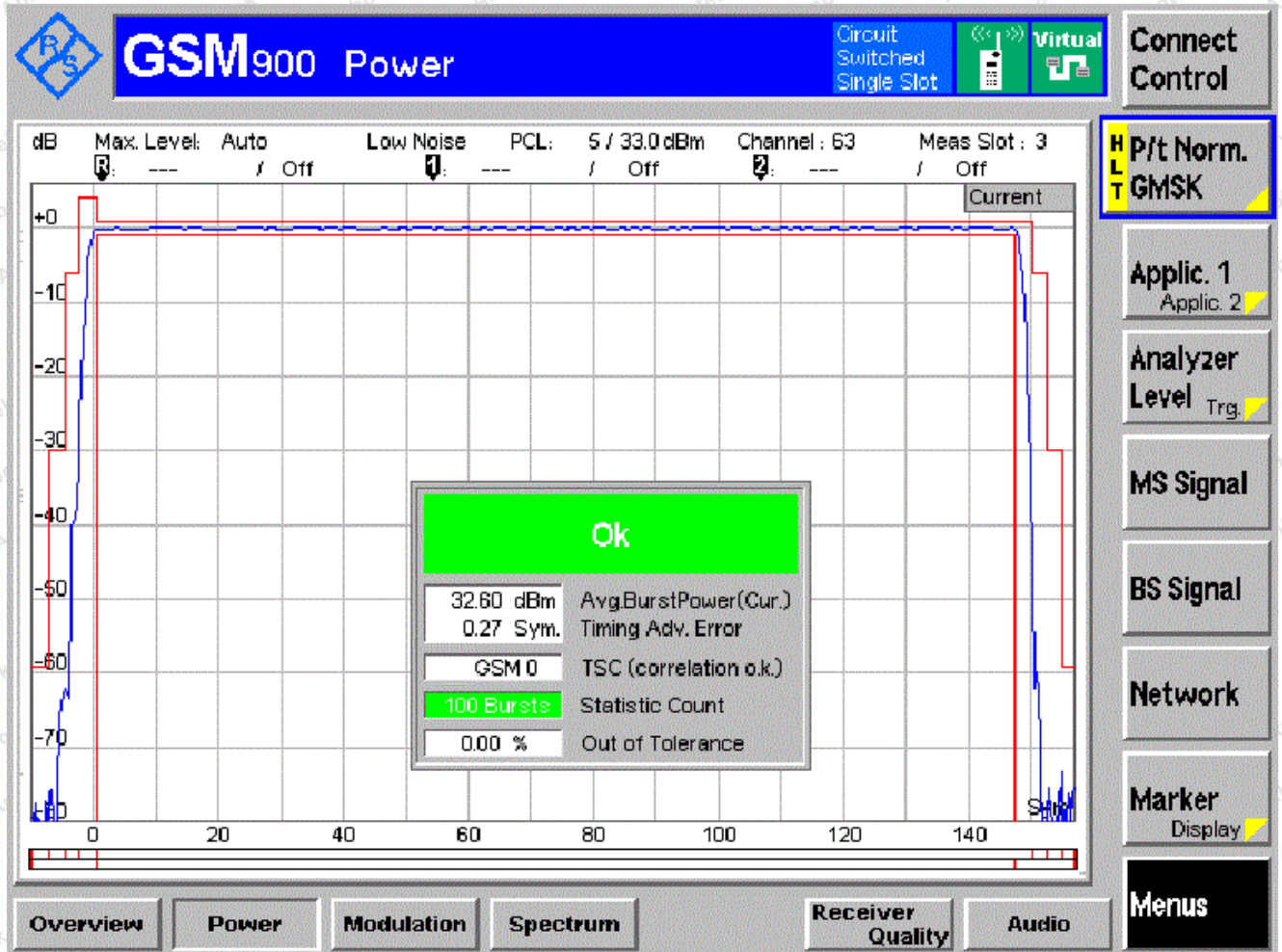
| Power VS Time Graph | ACCESS BURST | Result | | |
|---------------------|--------------|------------------|------|------|
| | | Traffic Channels | | |
| GSM900 | Power level | LCH | MCH | HCH |
| TN/VN | 5 | PASS | PASS | PASS |
| | 12 | PASS | PASS | PASS |
| | 19 | PASS | PASS | PASS |

| Power VS Time Graph | ACCESS BURST | Result | | |
|---------------------|--------------|------------------|------|------|
| | | Traffic Channels | | |
| DCS1800 | Power level | LCH | MCH | HCH |
| TN/VN | 0 | PASS | PASS | PASS |
| | 8 | PASS | PASS | PASS |
| | 15 | PASS | PASS | PASS |

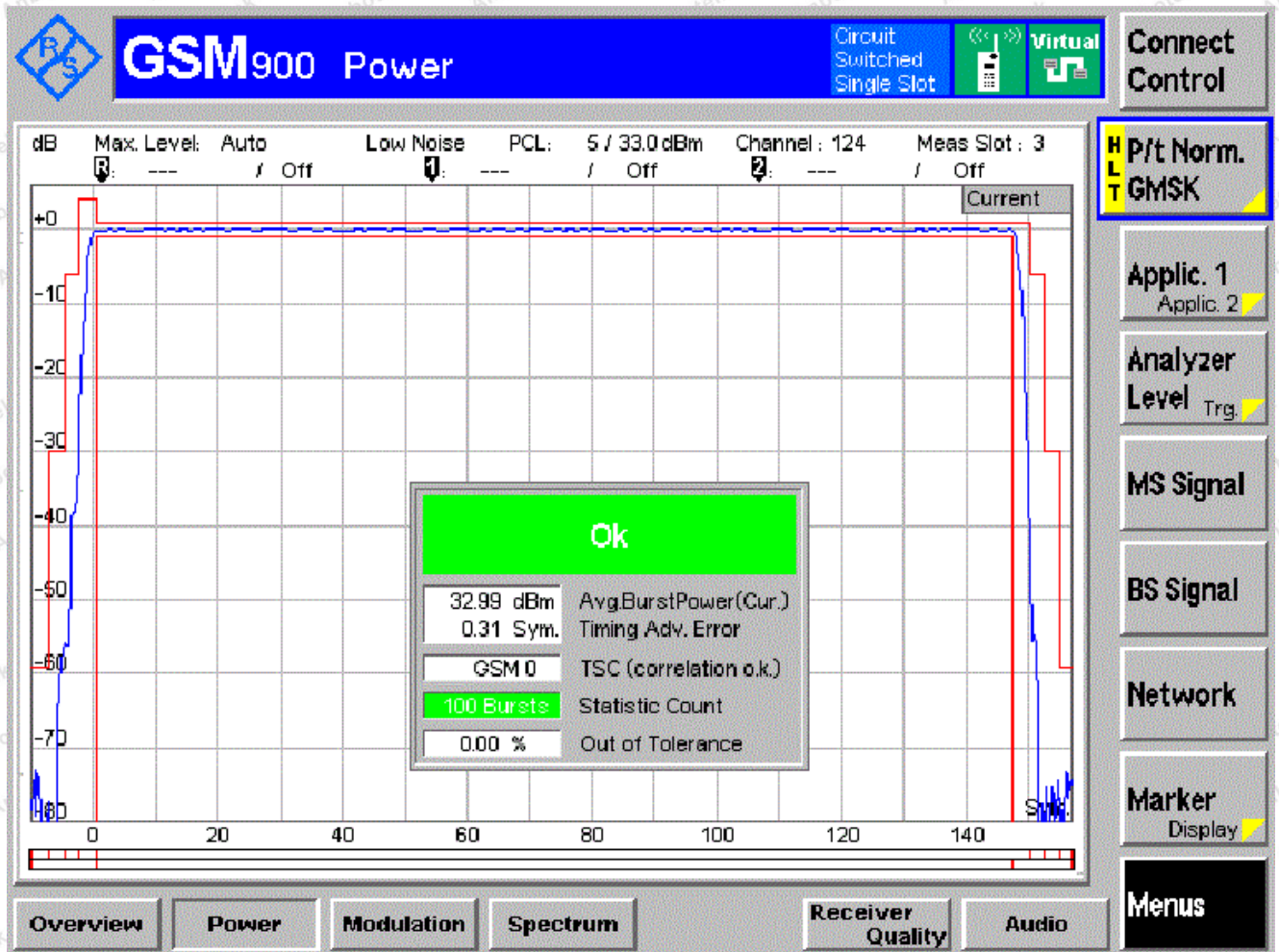
Graphs of output power and burst timing
GSM 900 TN/VN
Channel LCH PCL 5



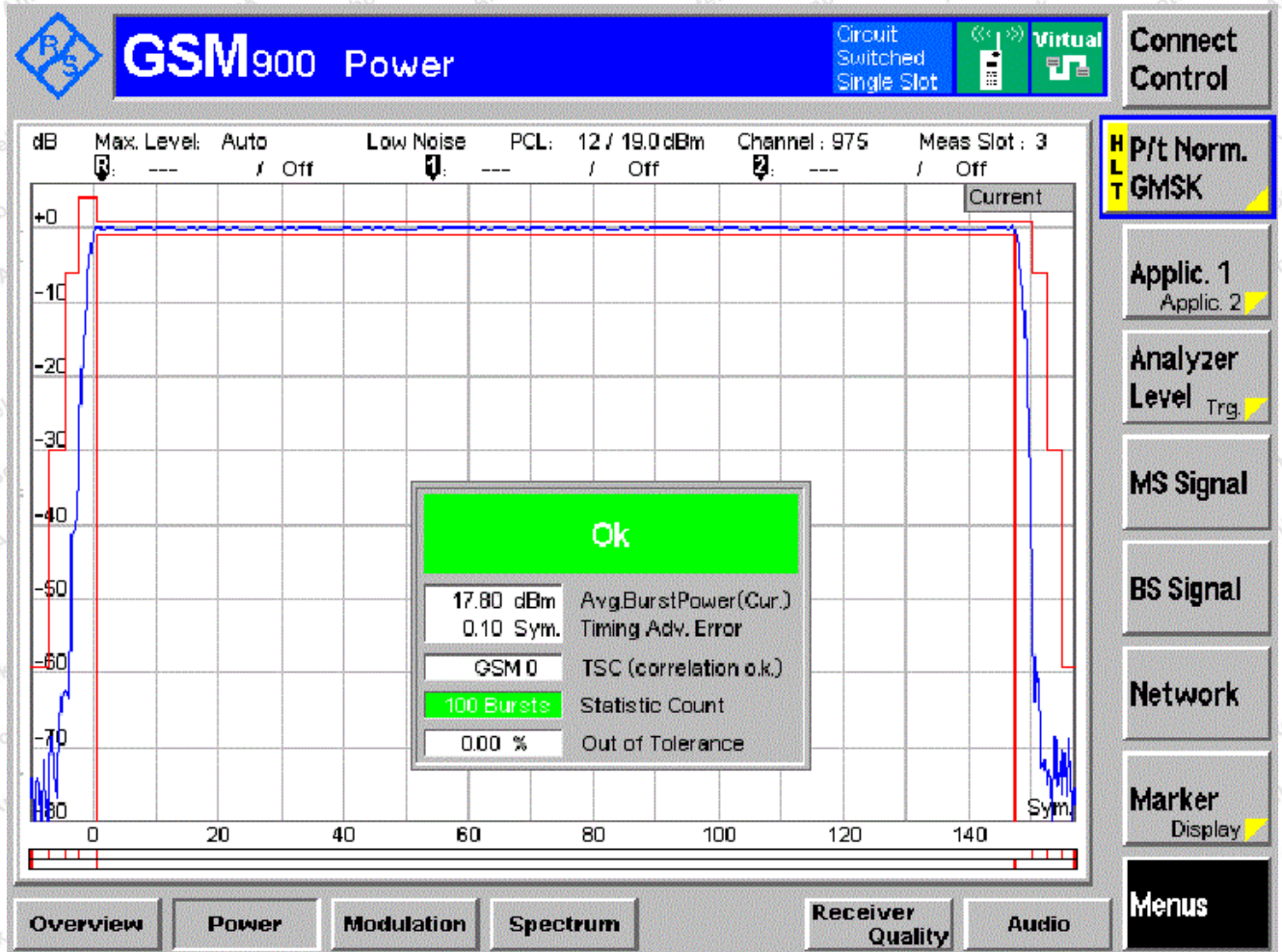
Channel MCH PCL 5



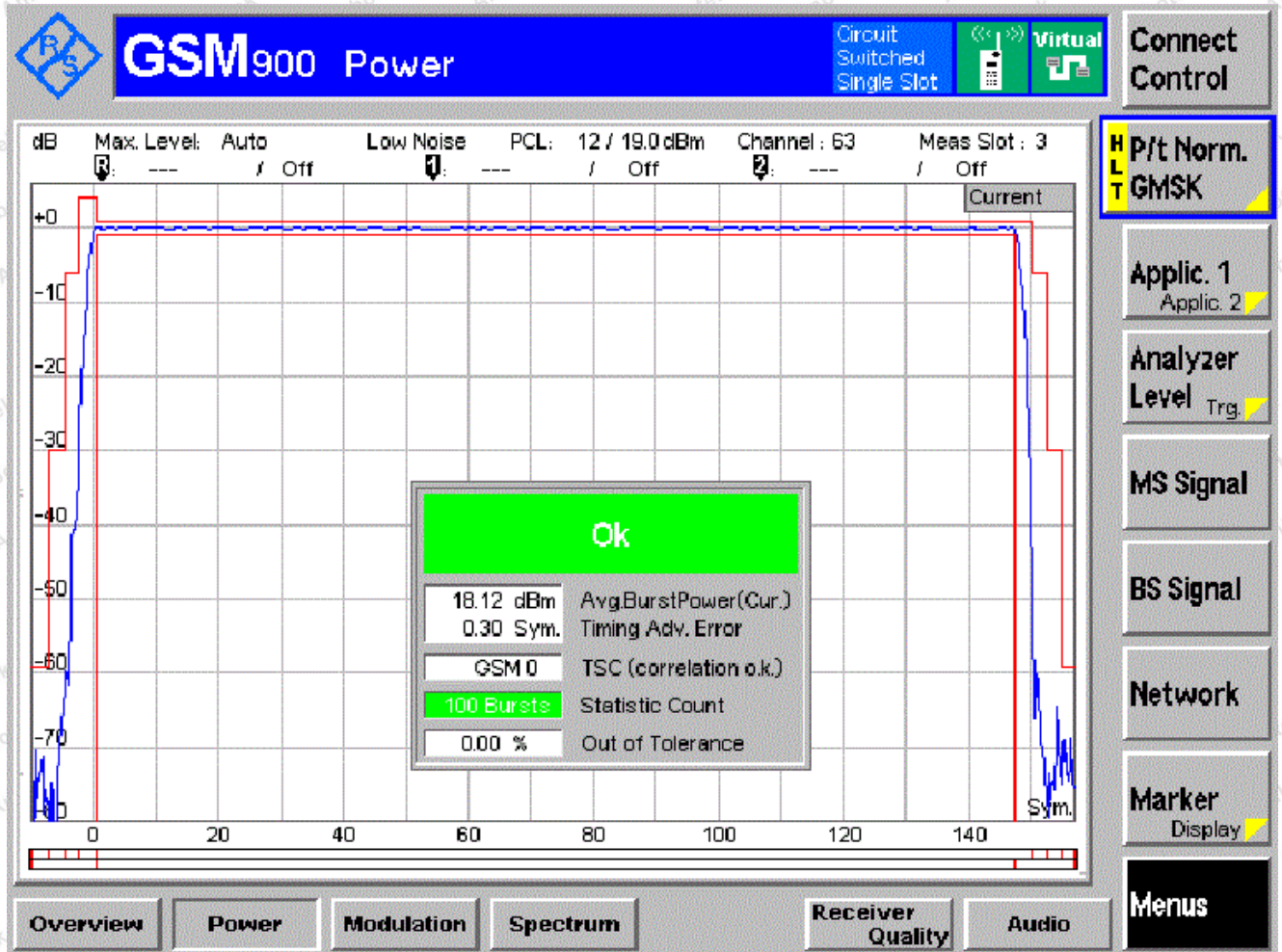
Channel HCH PCL 5



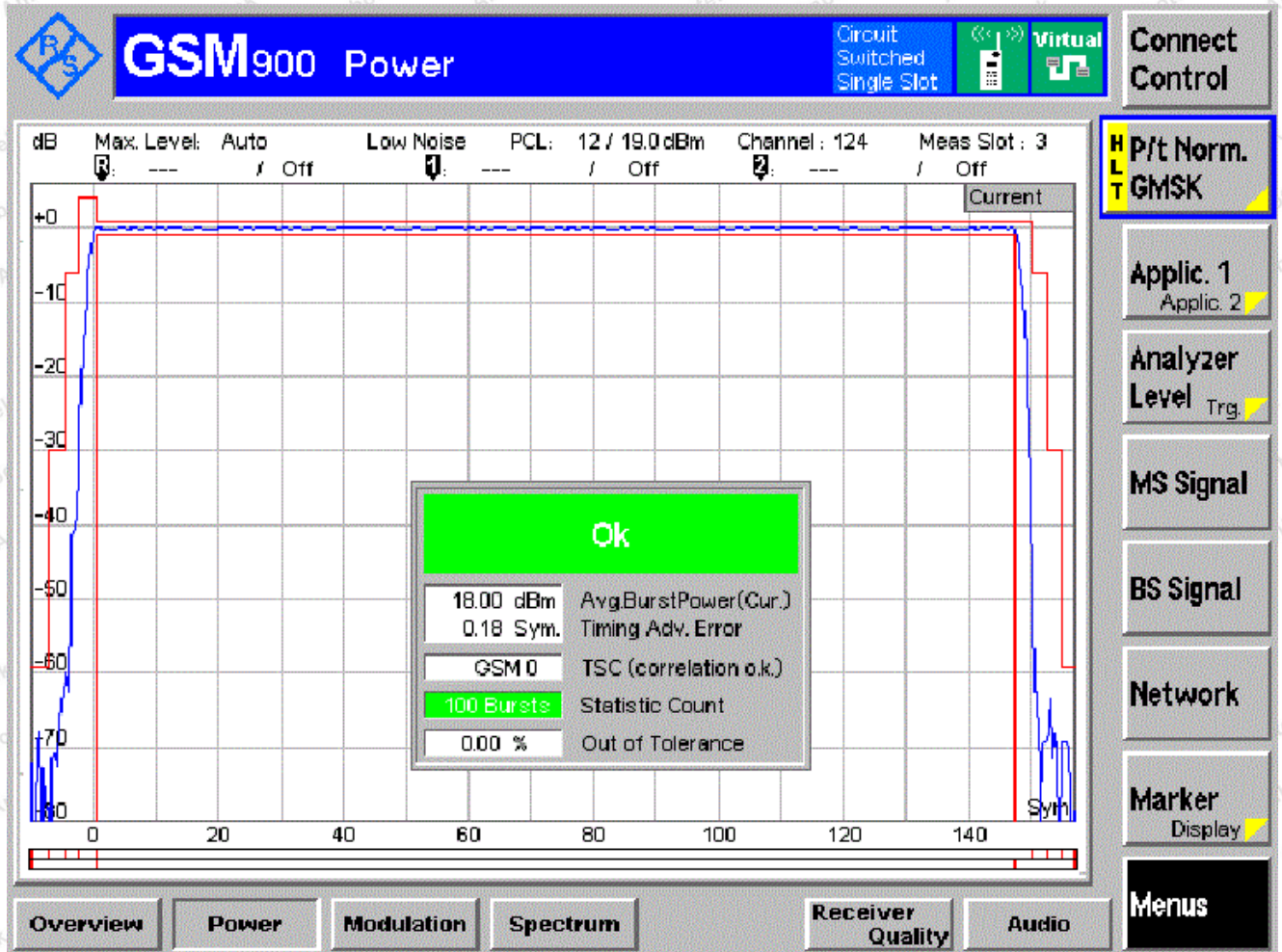
Channel LCH PCL 12



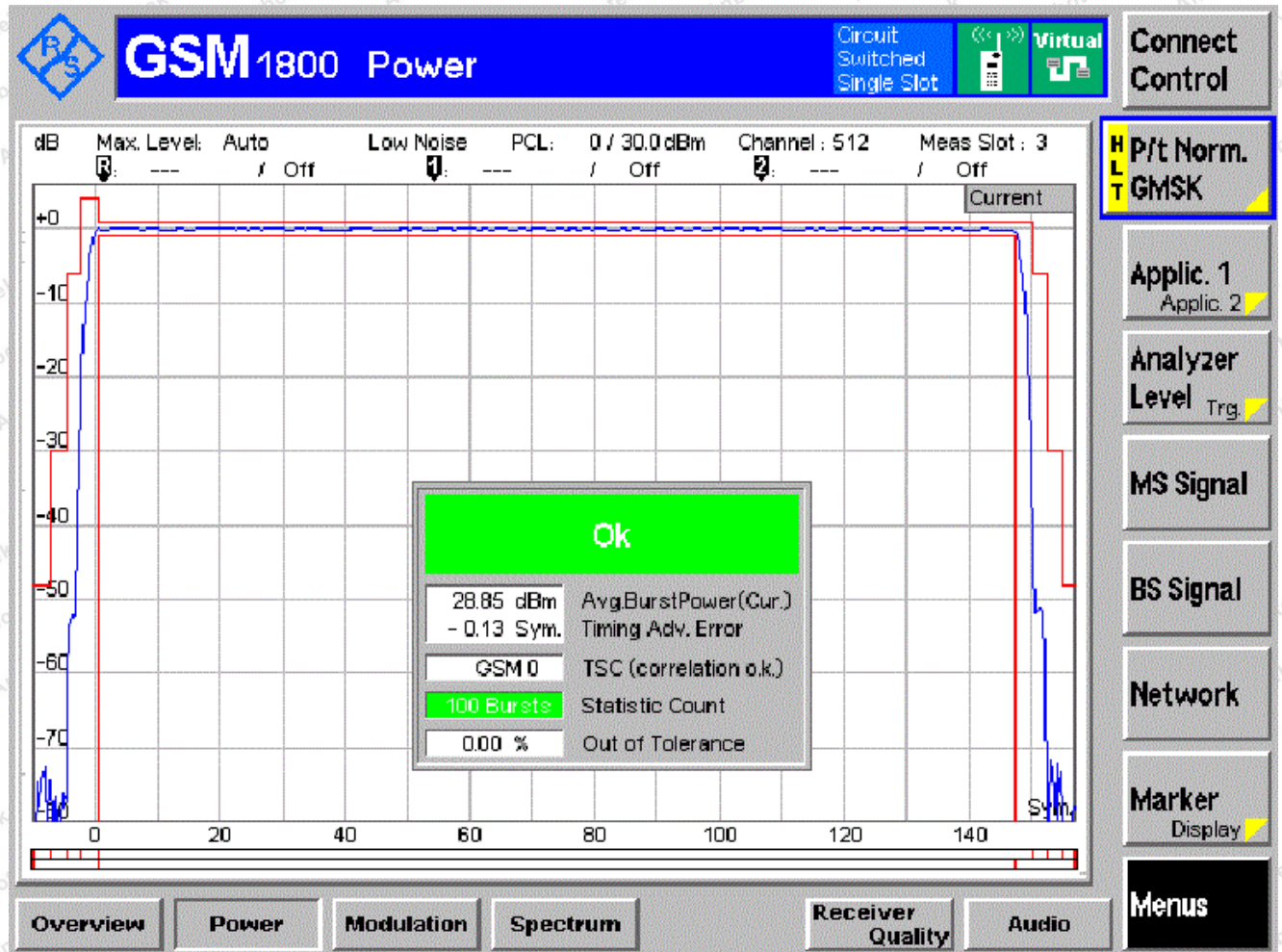
Channel MCH PCL 12



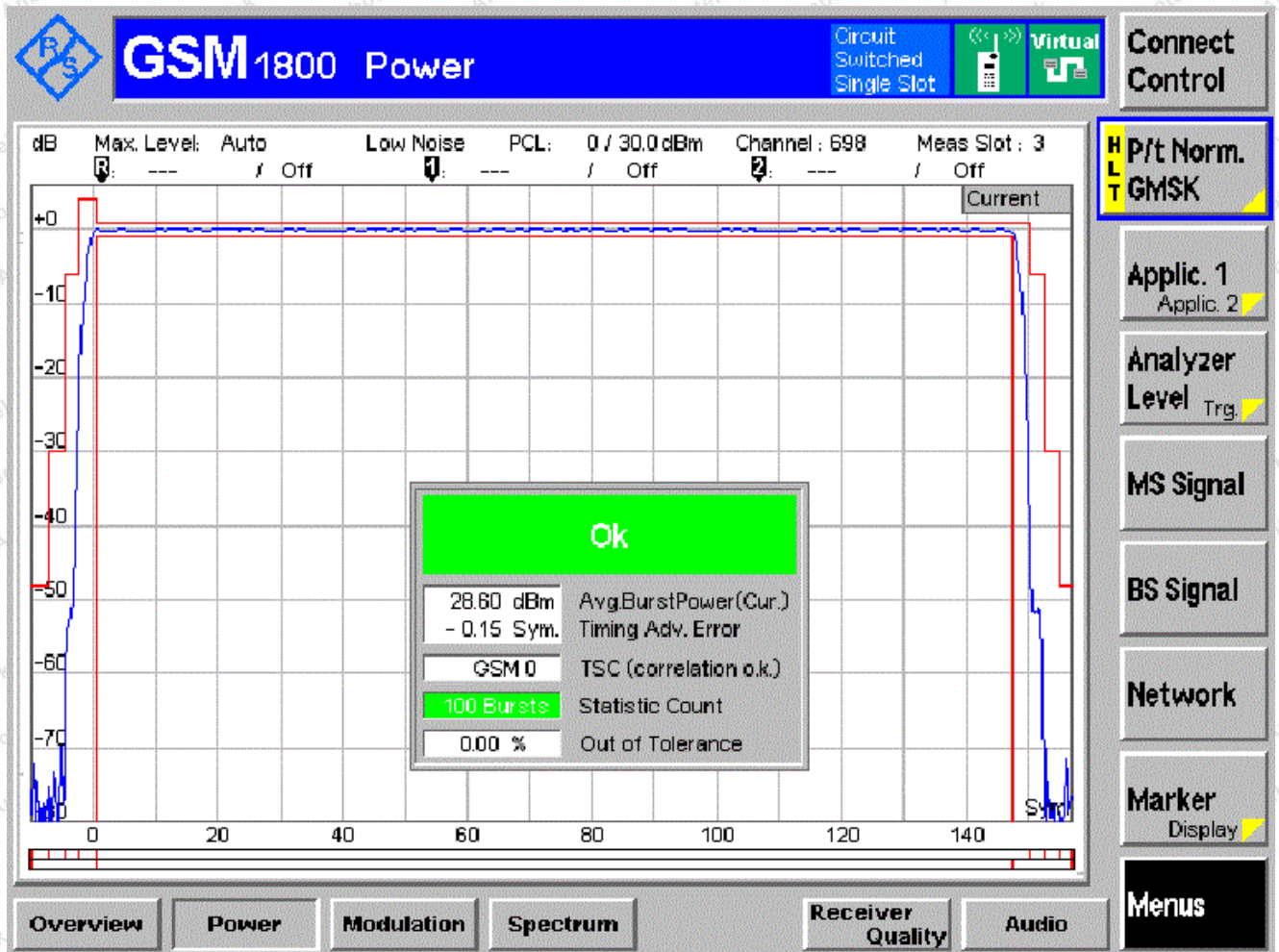
Channel HCH PCL 12



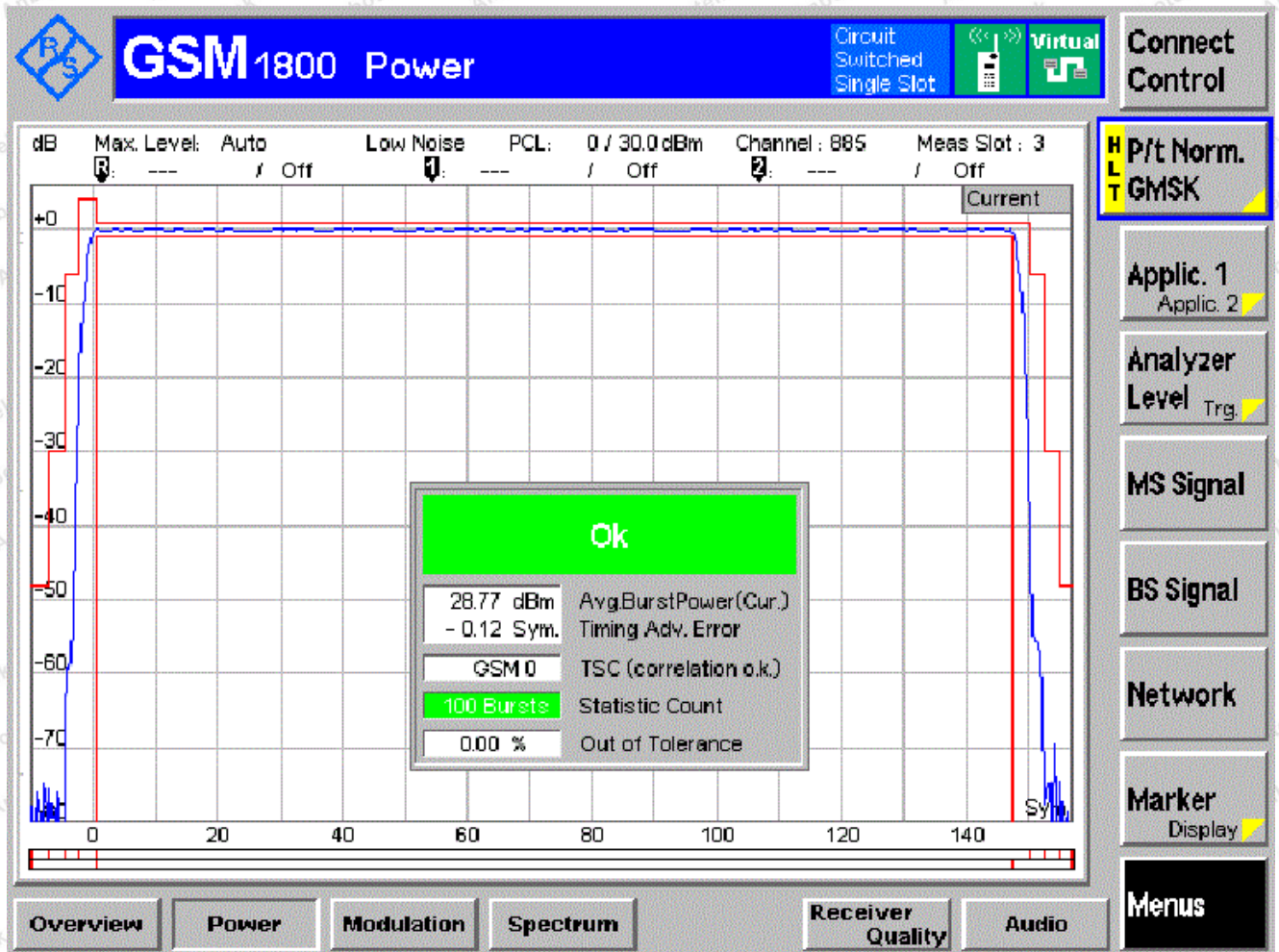
DCS1800 TN/VN
Channel LCH PCL 0



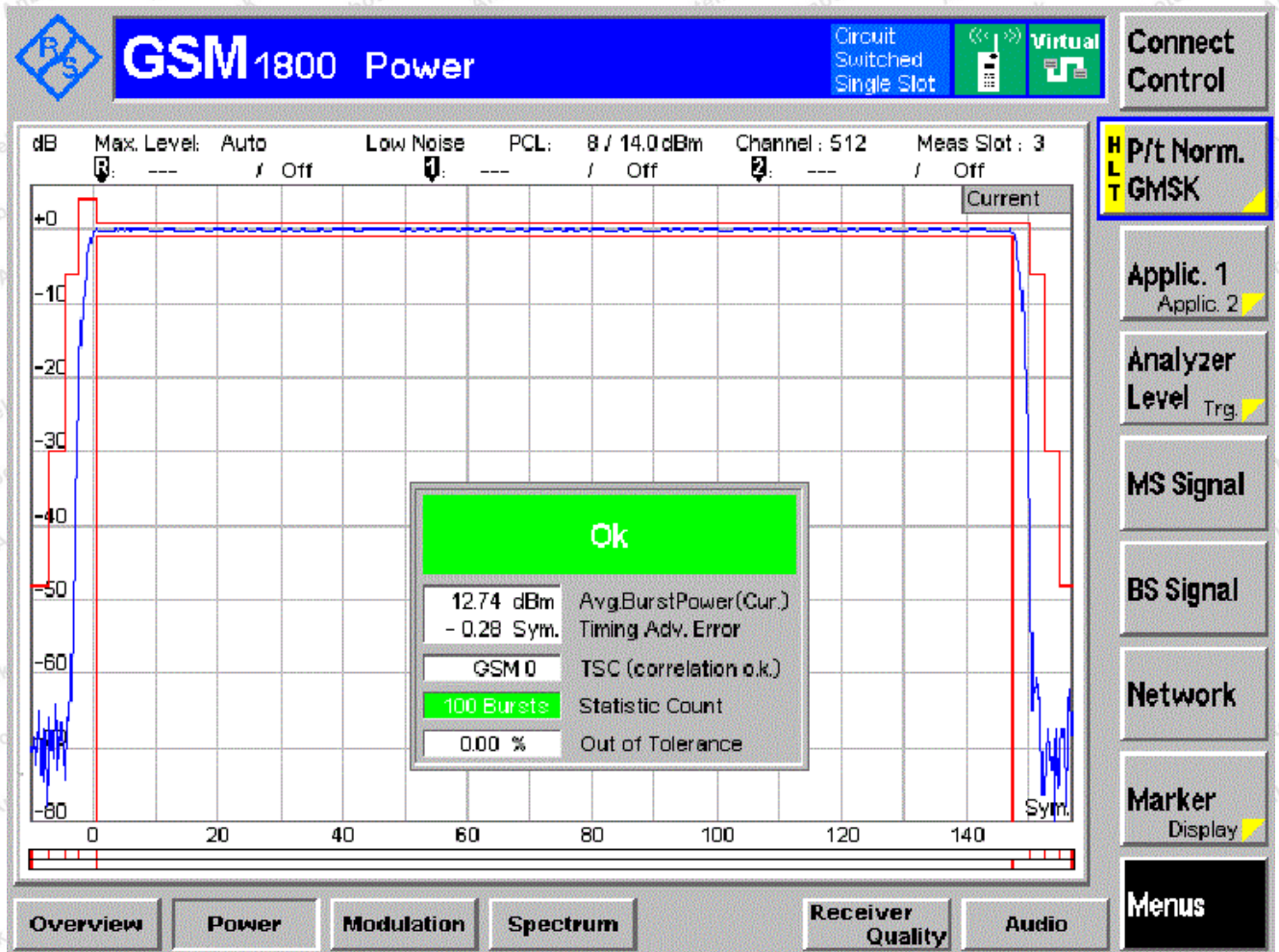
Channel MCH PCL 0



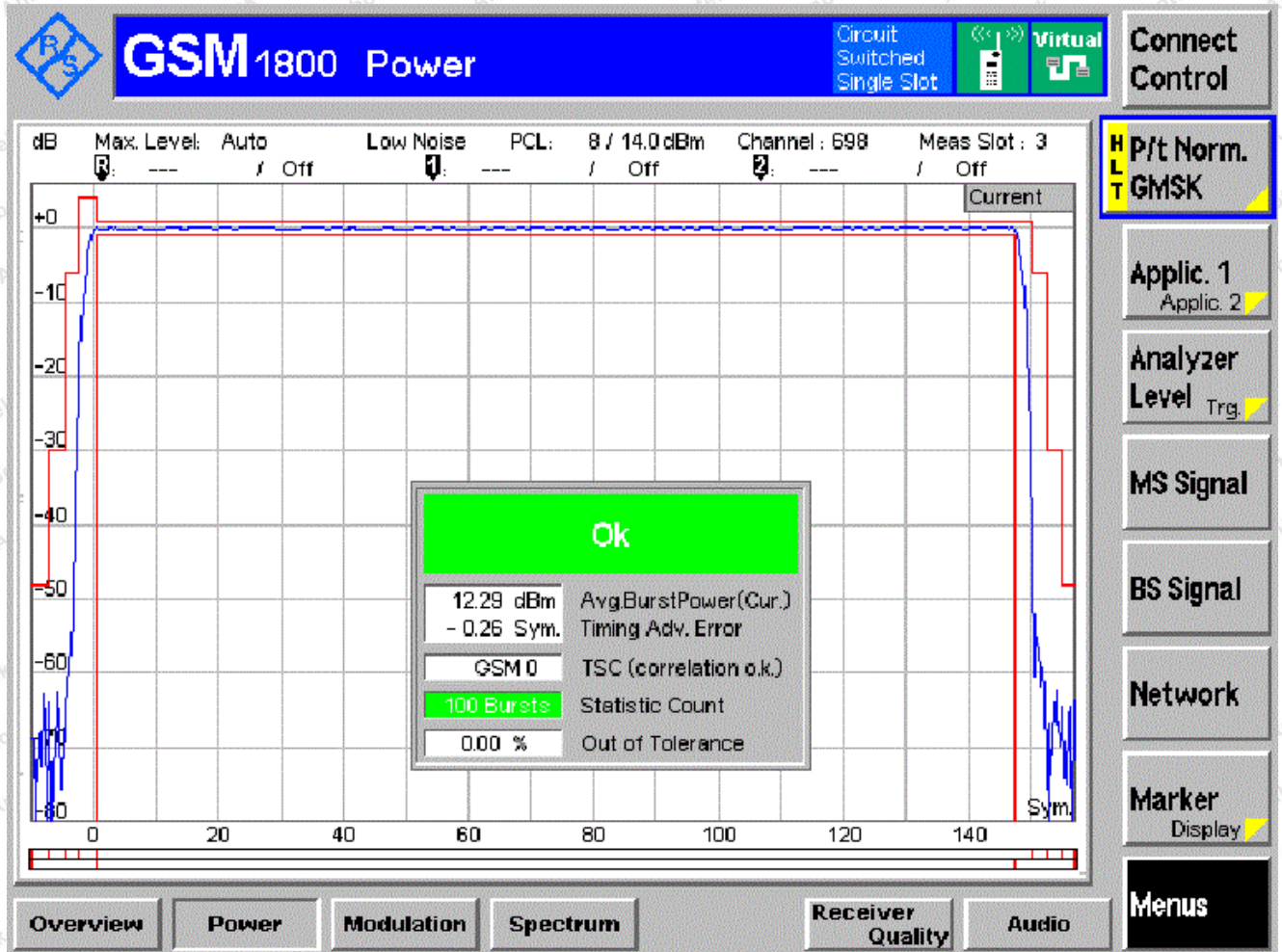
Channel HCH PCL 0



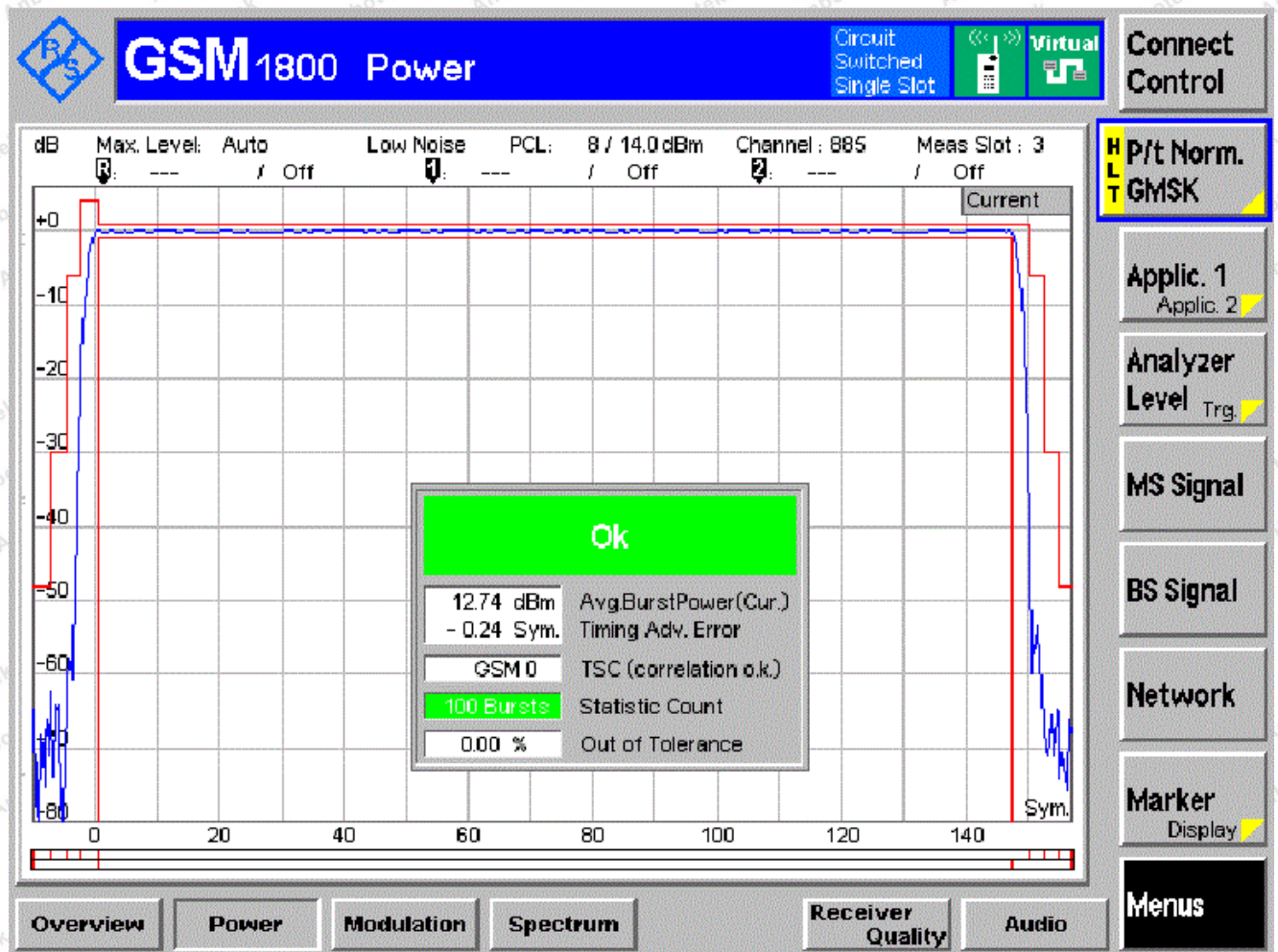
Channel LCH PCL 8



Channel MCH PCL 8



Channel HCH PCL 8

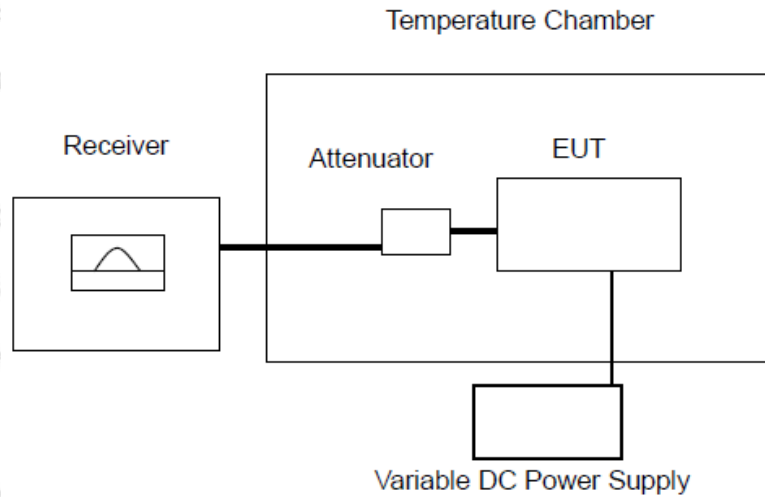


7. Transmitter - Output RF Spectrum

7.1. Test Limit

Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.4.5

7.2. Test Setup



7.3. Test Procedure

1. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.4.3 for the test conditions.
2. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.4.4 for the measurement method.

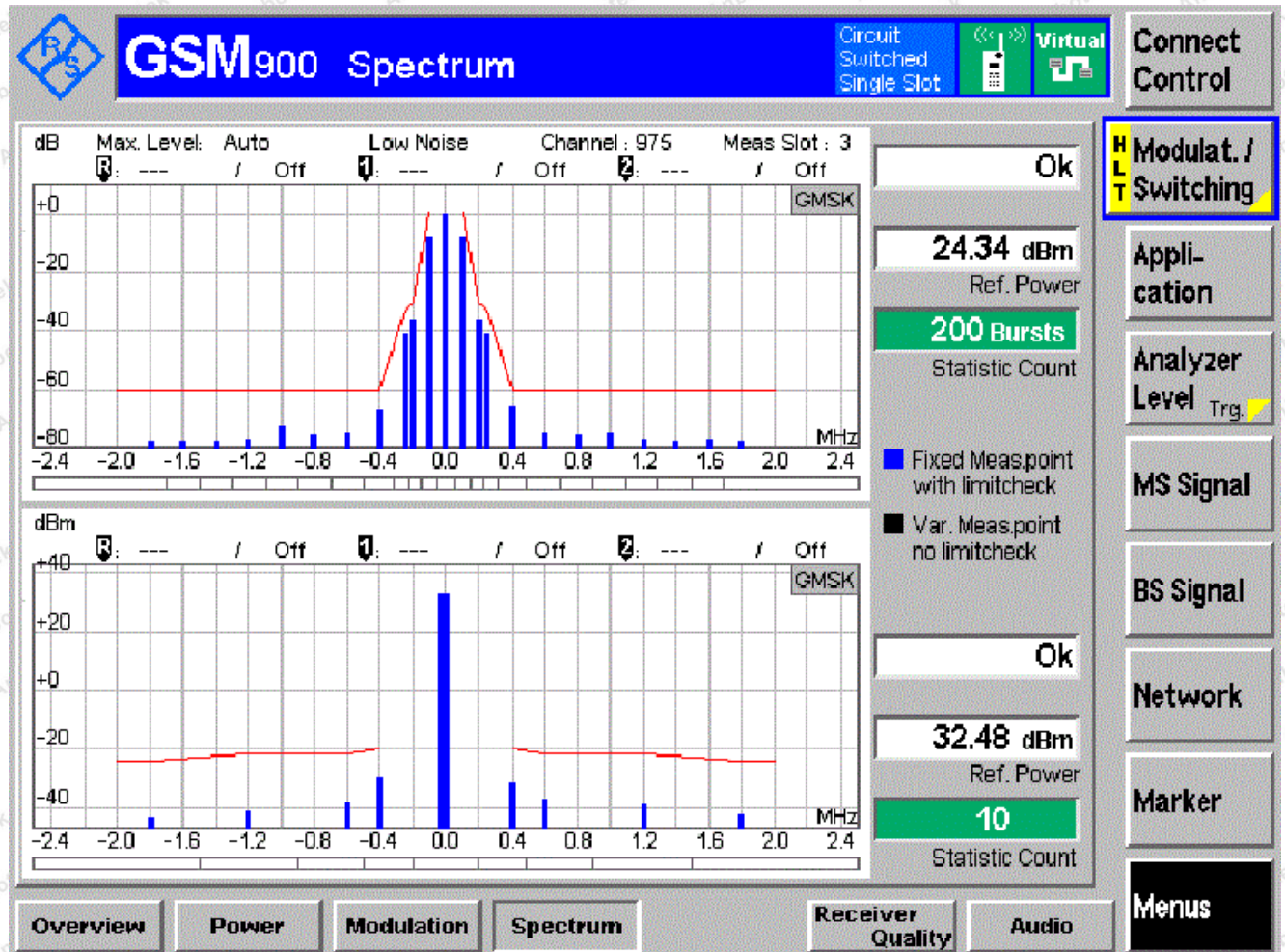
7.4. Test Result

| | | | |
|--------------|----------|--------------------|------------------------|
| Temperature: | 25° C | Relative Humidity: | 63 % |
| Pressure: | 1012 hPa | Test Voltage: | DC 3.7V Battery inside |

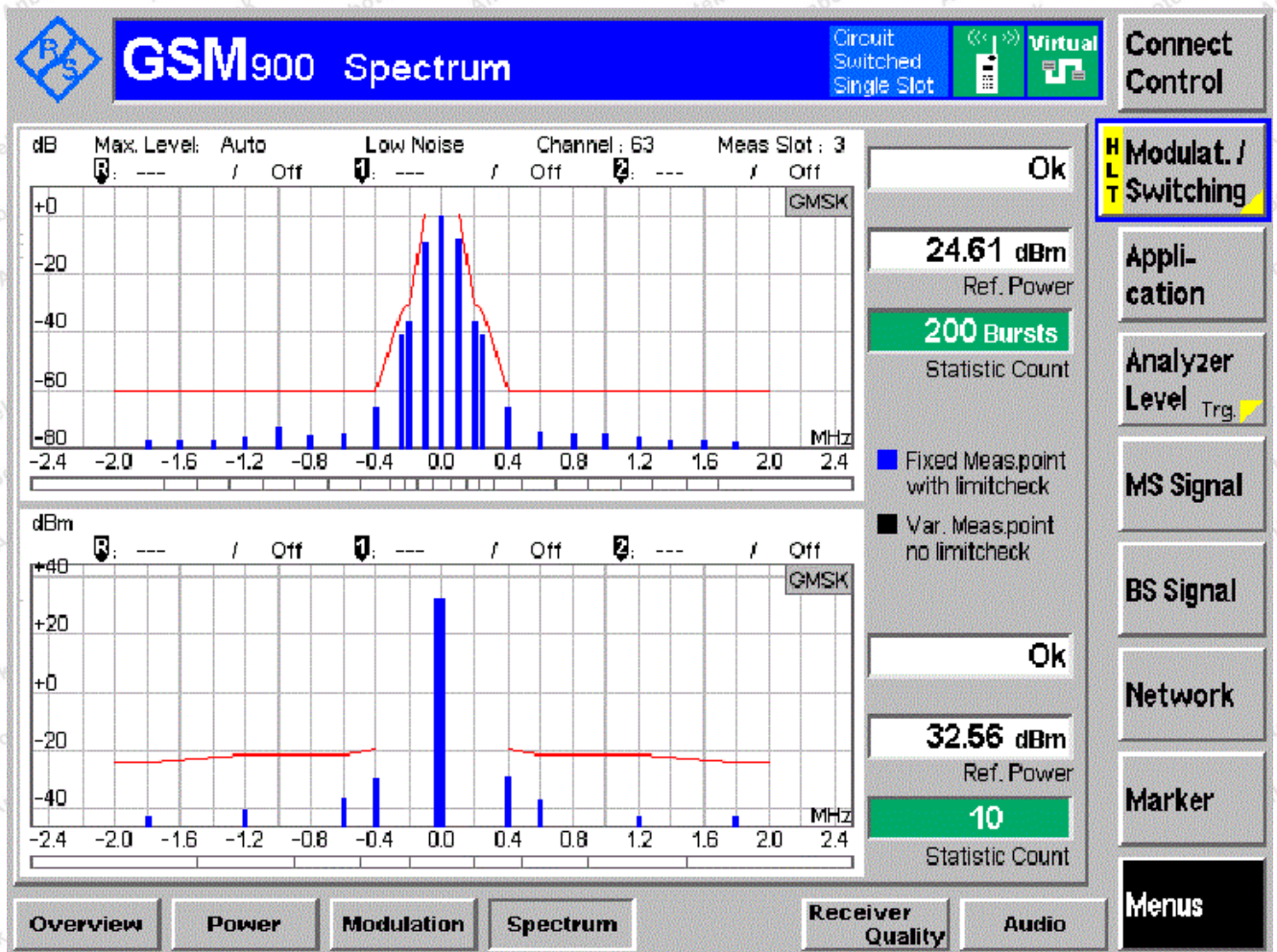
| Modulation& switch Spectrum | Power level | Result | | |
|--------------------------------|-------------|------------------|------|------|
| | | Traffic Channels | | |
| GSM900 | | LCH | MCH | HCH |
| TN/VN | 5 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 19 | PASS | PASS | PASS |
| TL/VL | 5 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 19 | PASS | PASS | PASS |
| TL/VH | 5 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 19 | PASS | PASS | PASS |
| TH/VL | 5 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 19 | PASS | PASS | PASS |
| TH/VH | 5 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 19 | PASS | PASS | PASS |

| Modulation& switch Spectrum | Power level | Result | | |
|--------------------------------|-------------|------------------|------|------|
| | | Traffic Channels | | |
| DCS1800 | | LCH | MCH | HCH |
| TN/VN | 0 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 15 | PASS | PASS | PASS |
| TL/VL | 0 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 15 | PASS | PASS | PASS |
| TL/VH | 0 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 15 | PASS | PASS | PASS |
| TH/VL | 0 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 15 | PASS | PASS | PASS |
| TH/VH | 0 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 15 | PASS | PASS | PASS |

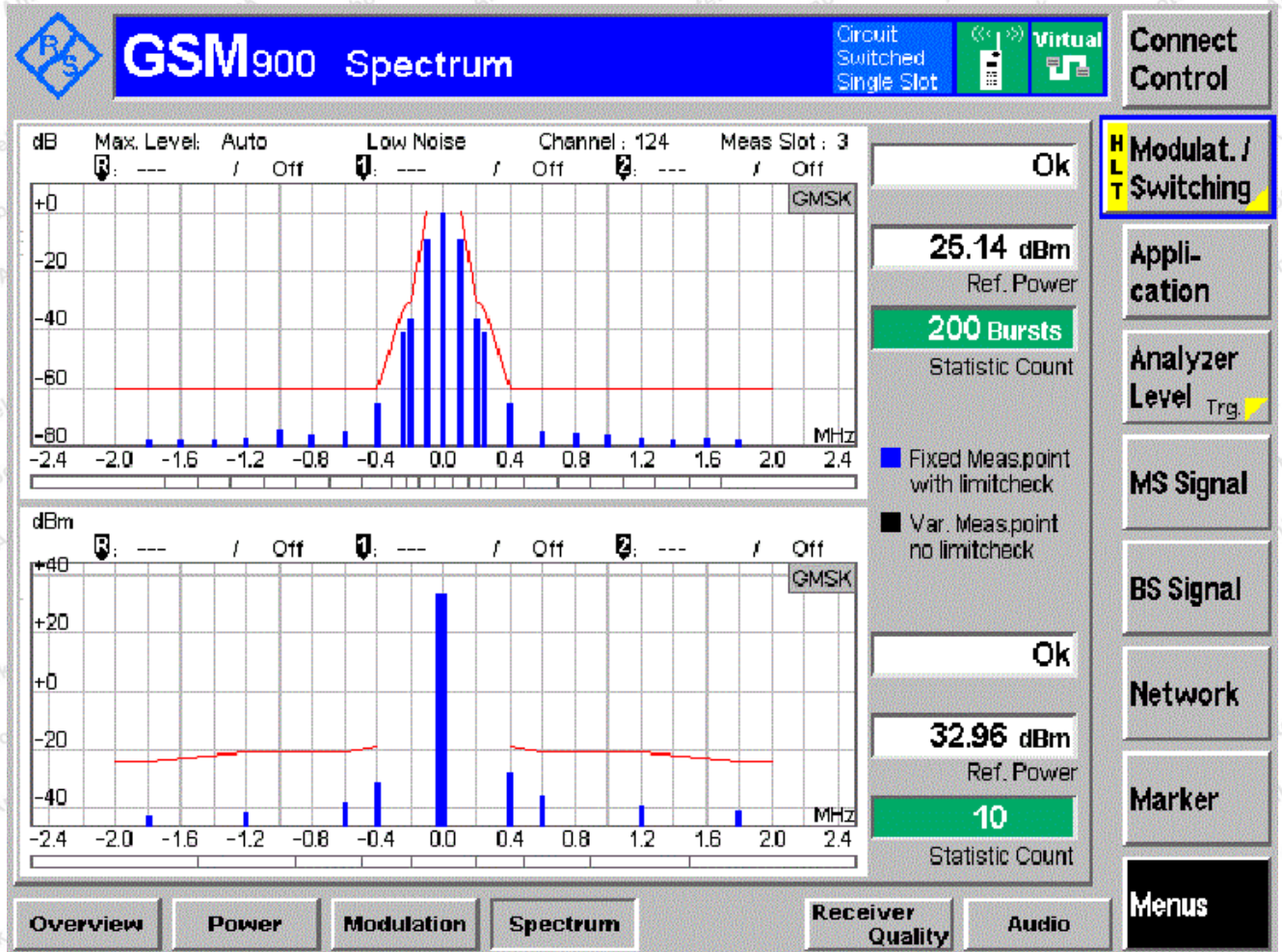
GSM 900 TN/VN
Channel LCH PCL 5



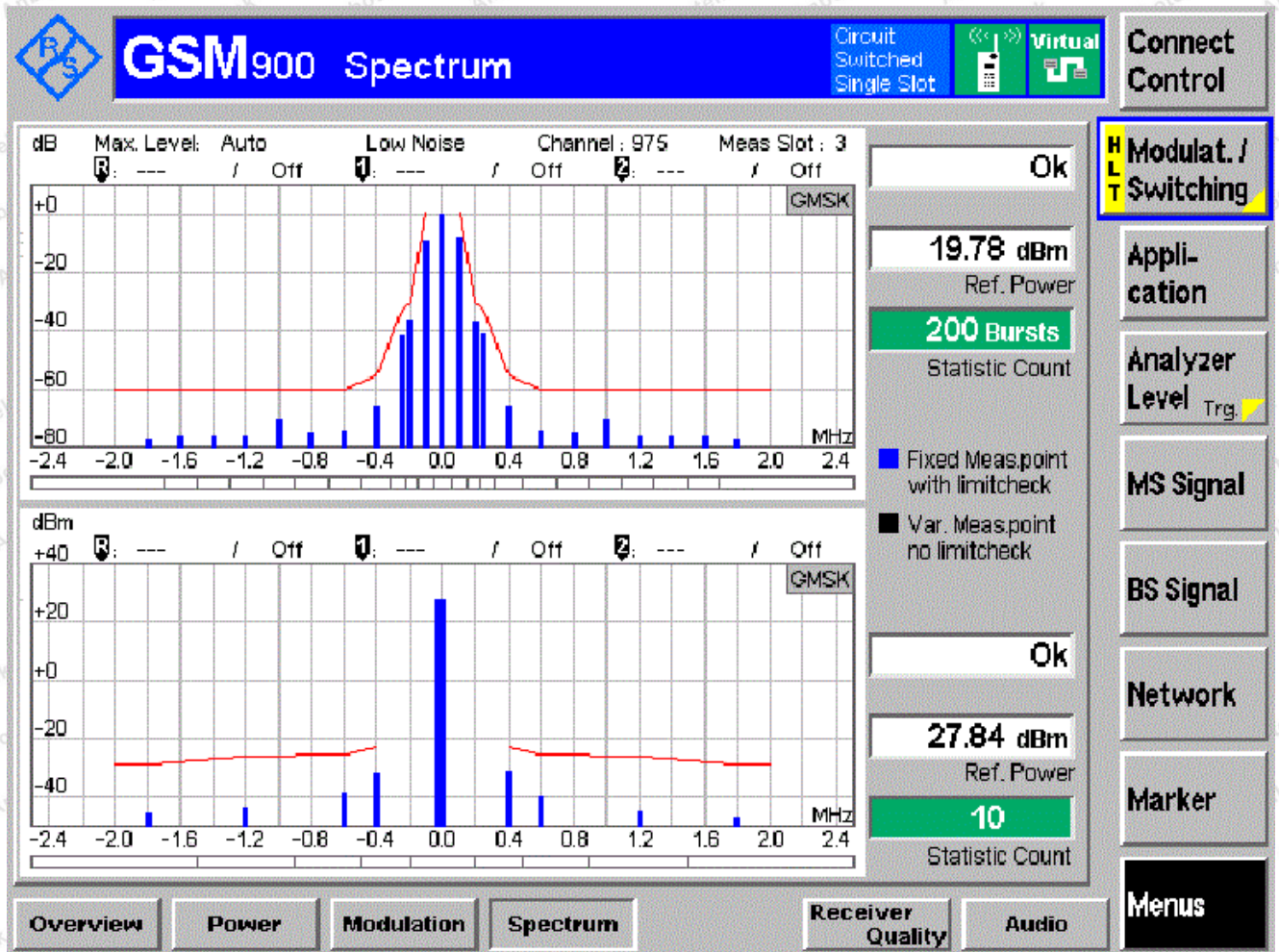
Channel MCH PCL 5



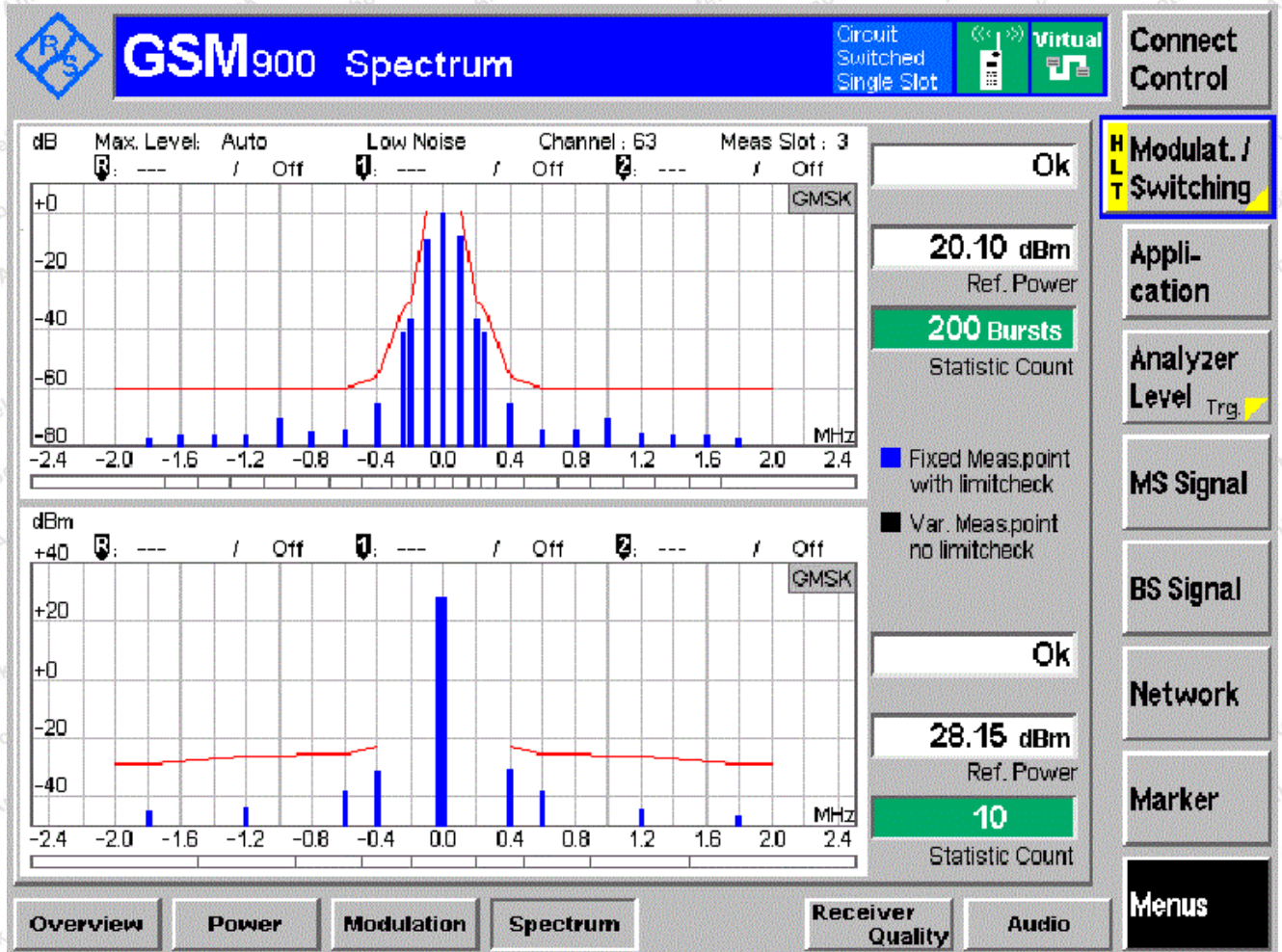
Channel HCH PCL 5



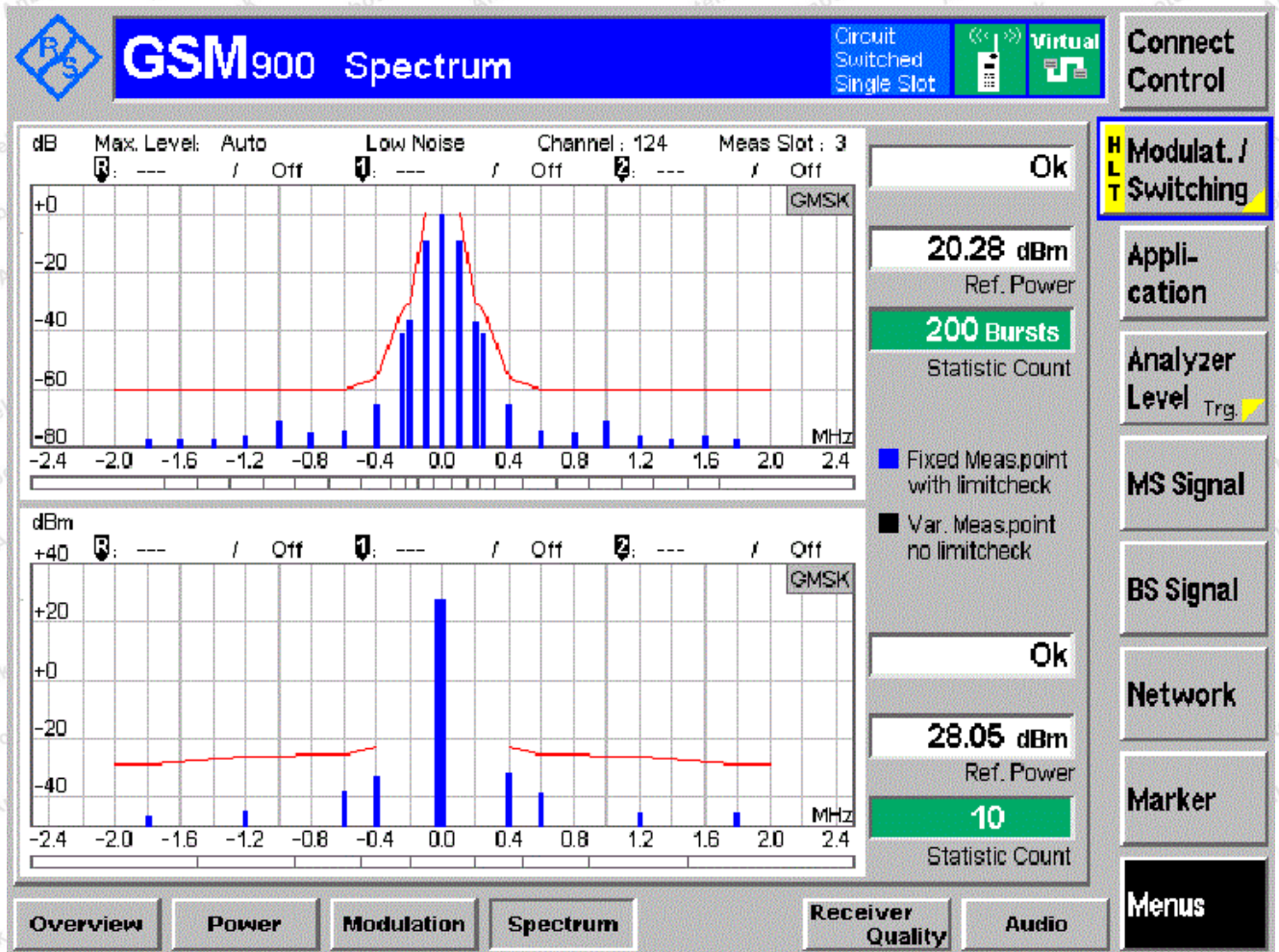
Channel LCH PCL 7



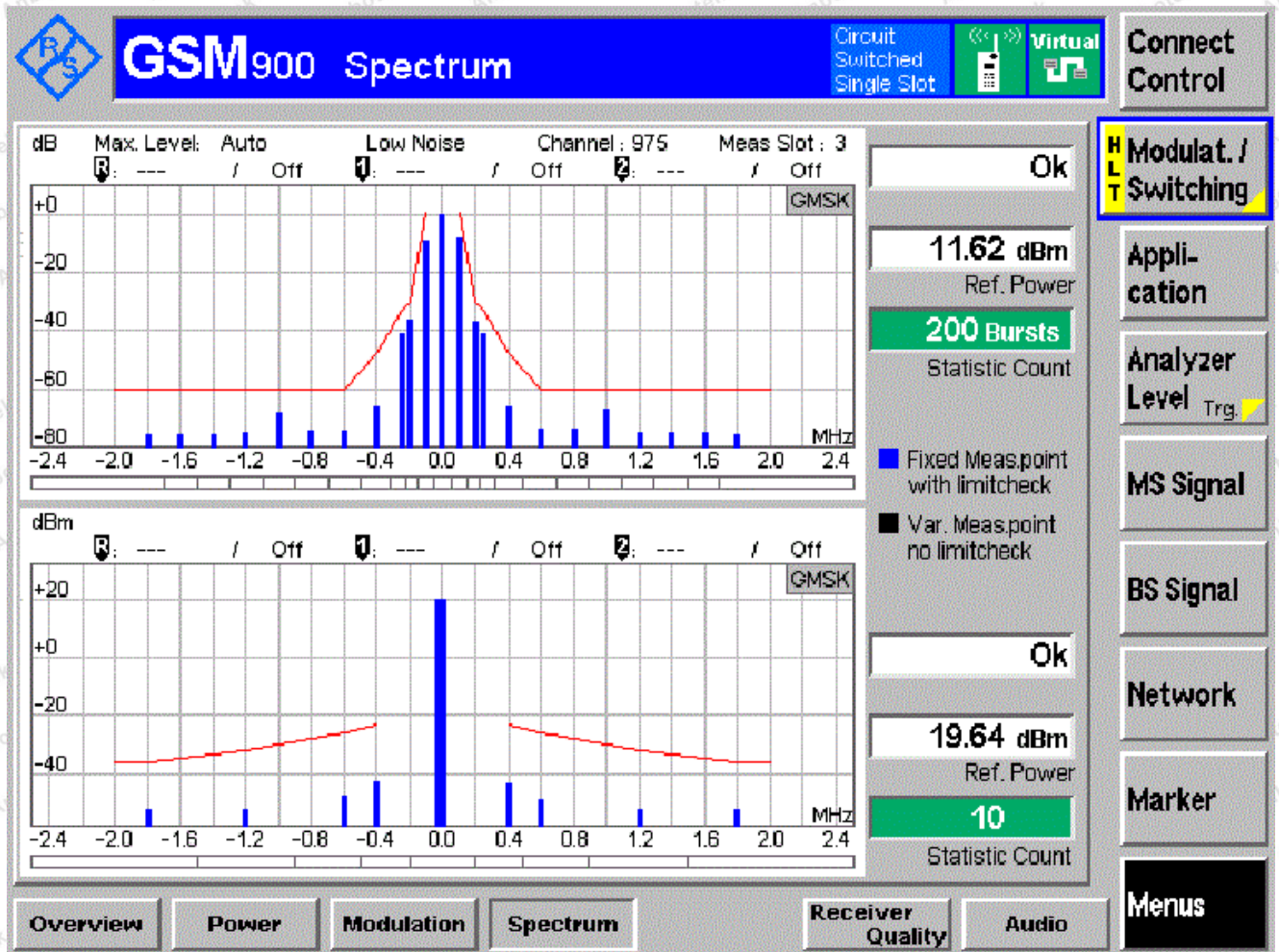
Channel MCH PCL 7



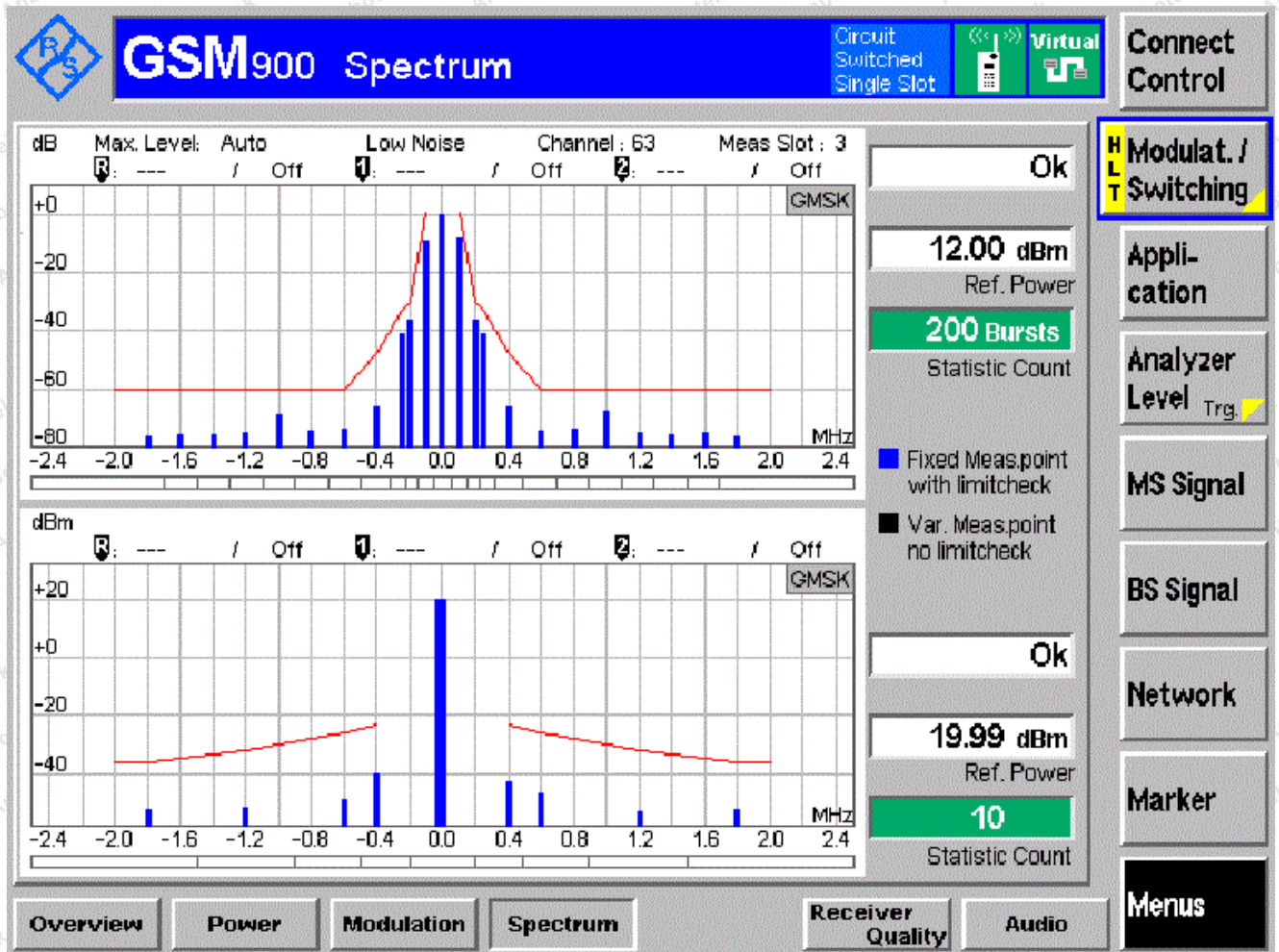
Channel HCH PCL 7



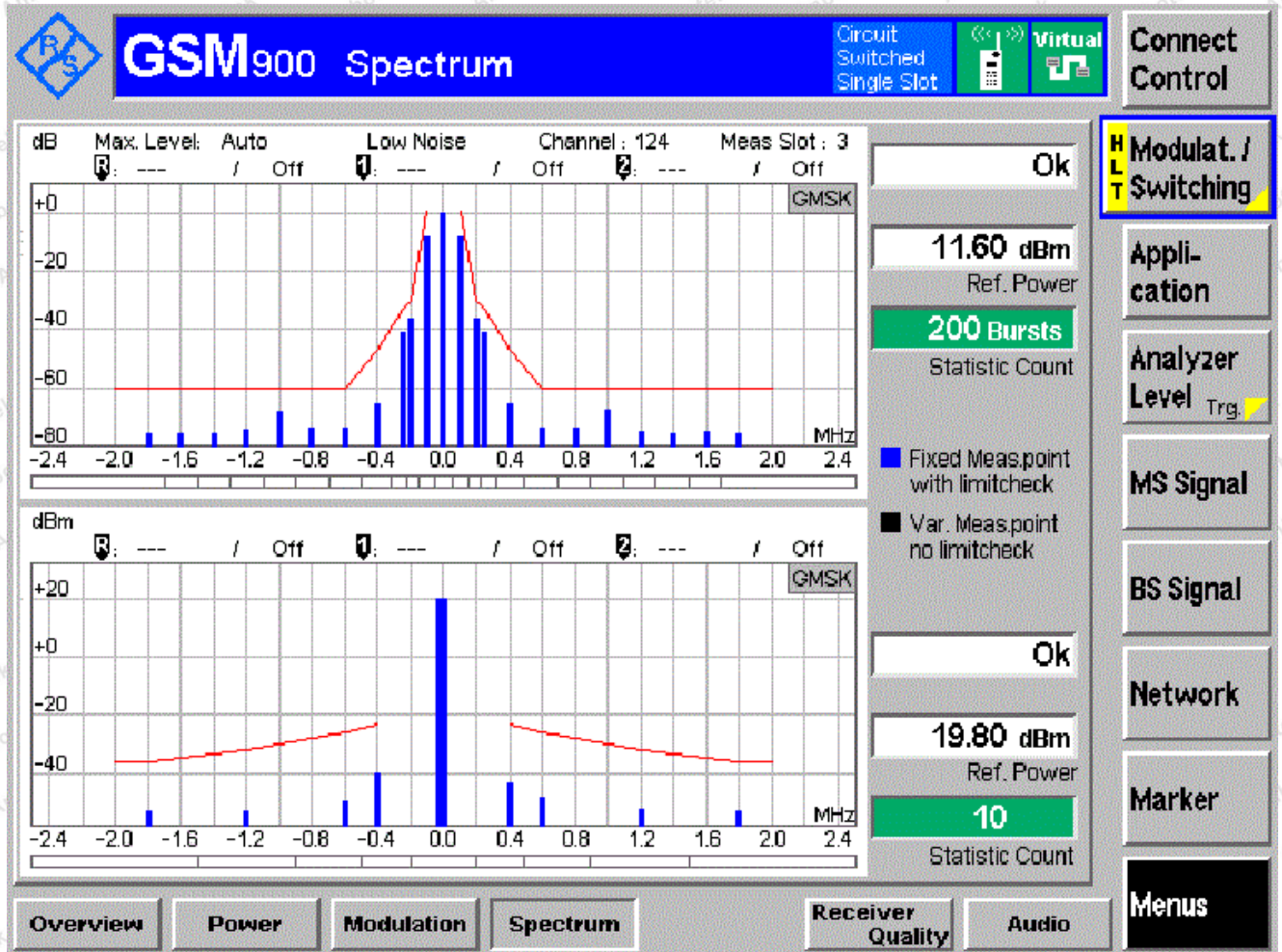
Channel LCH PCL 11



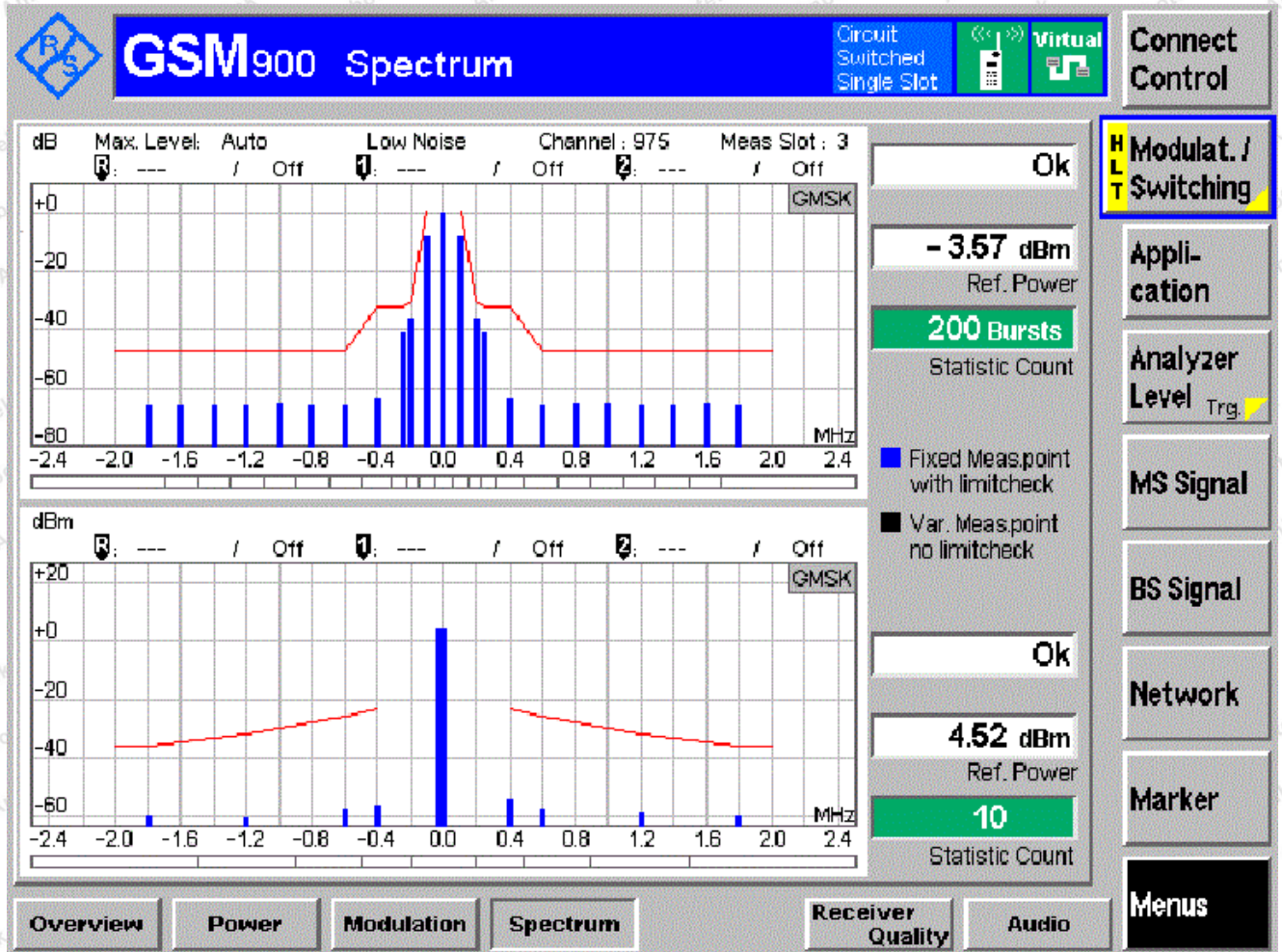
Channel MCH PCL 11



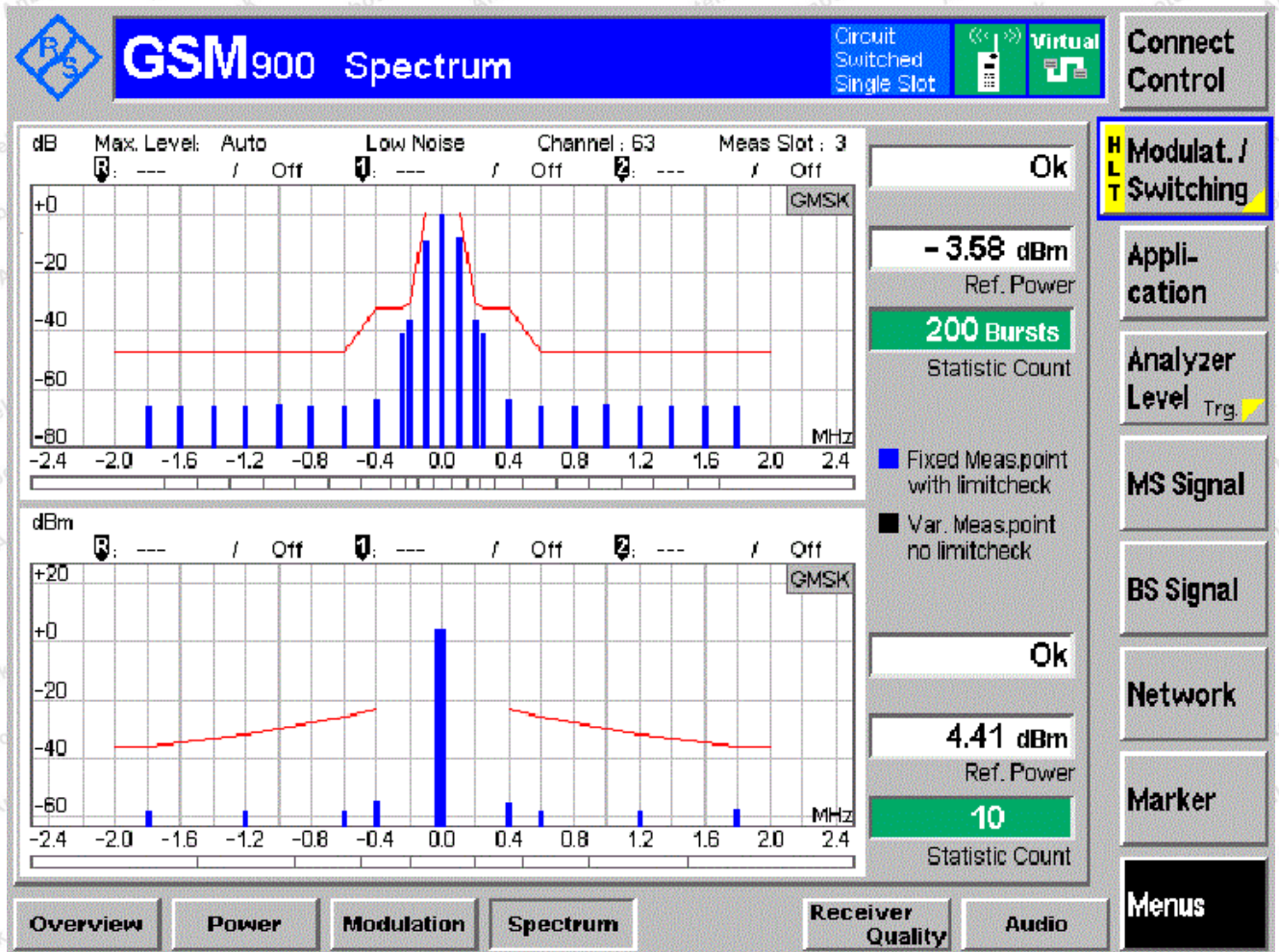
Channel HCH PCL 11



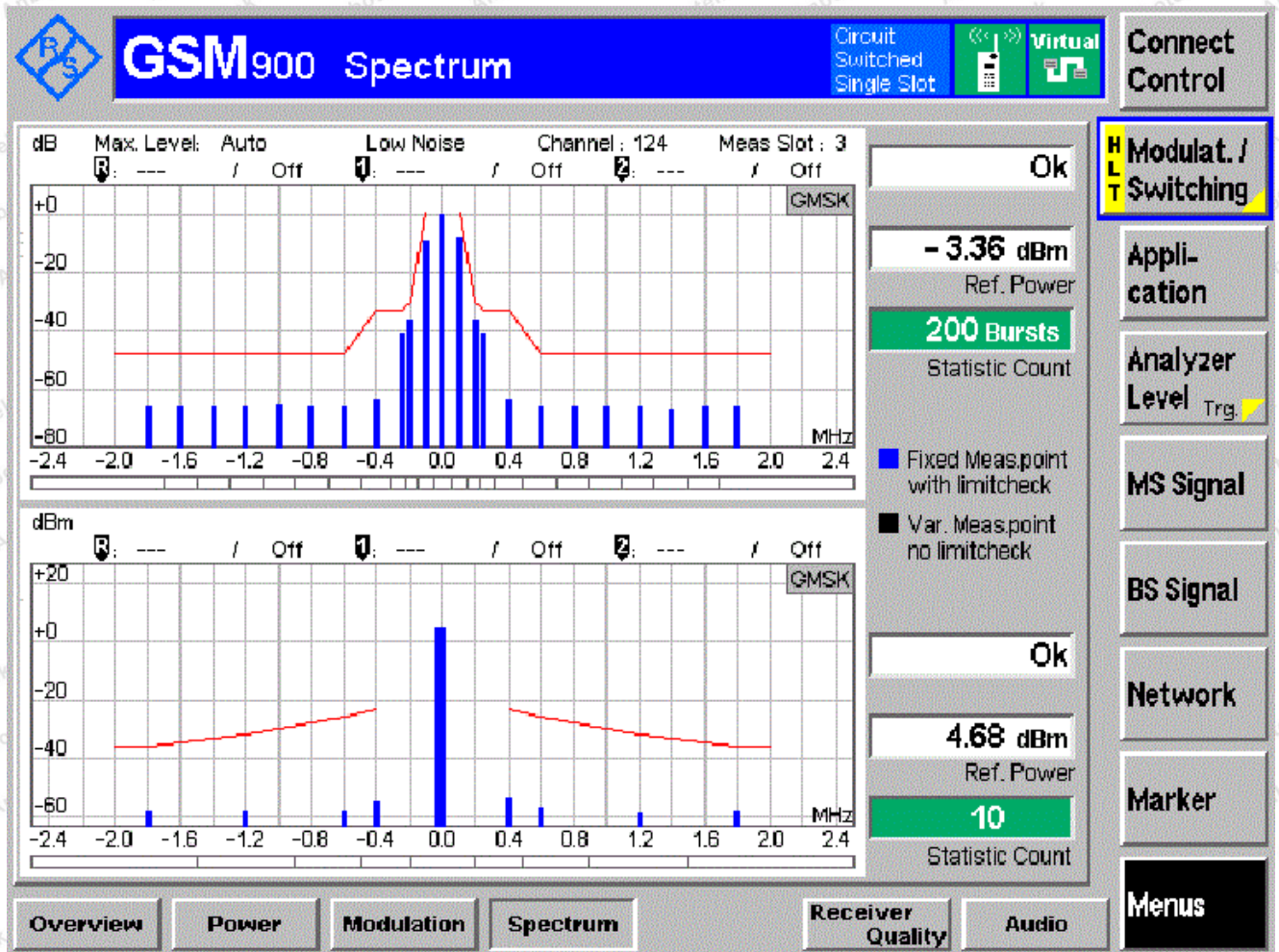
Channel LCH PCL 19



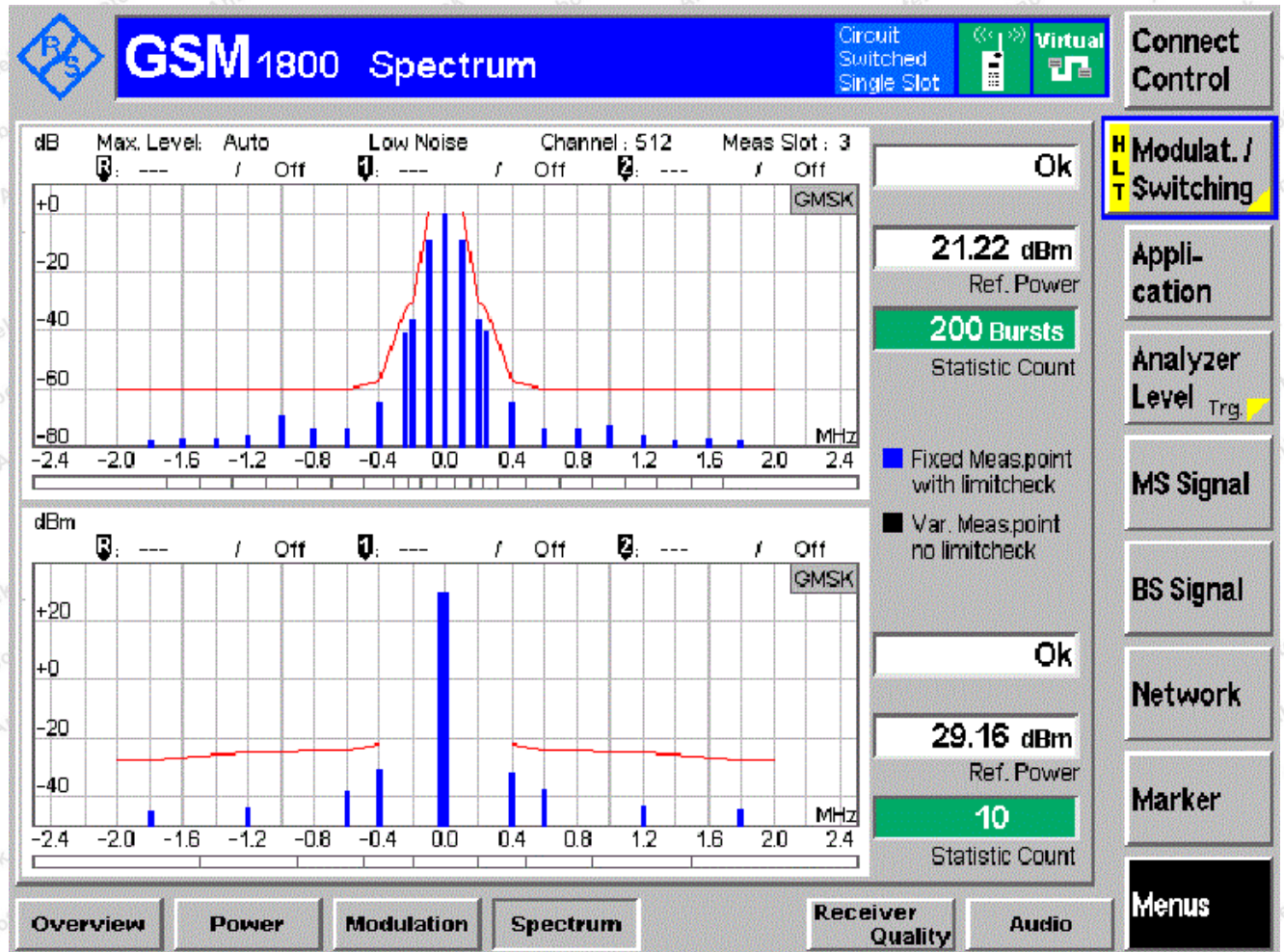
Channel MCH PCL 19



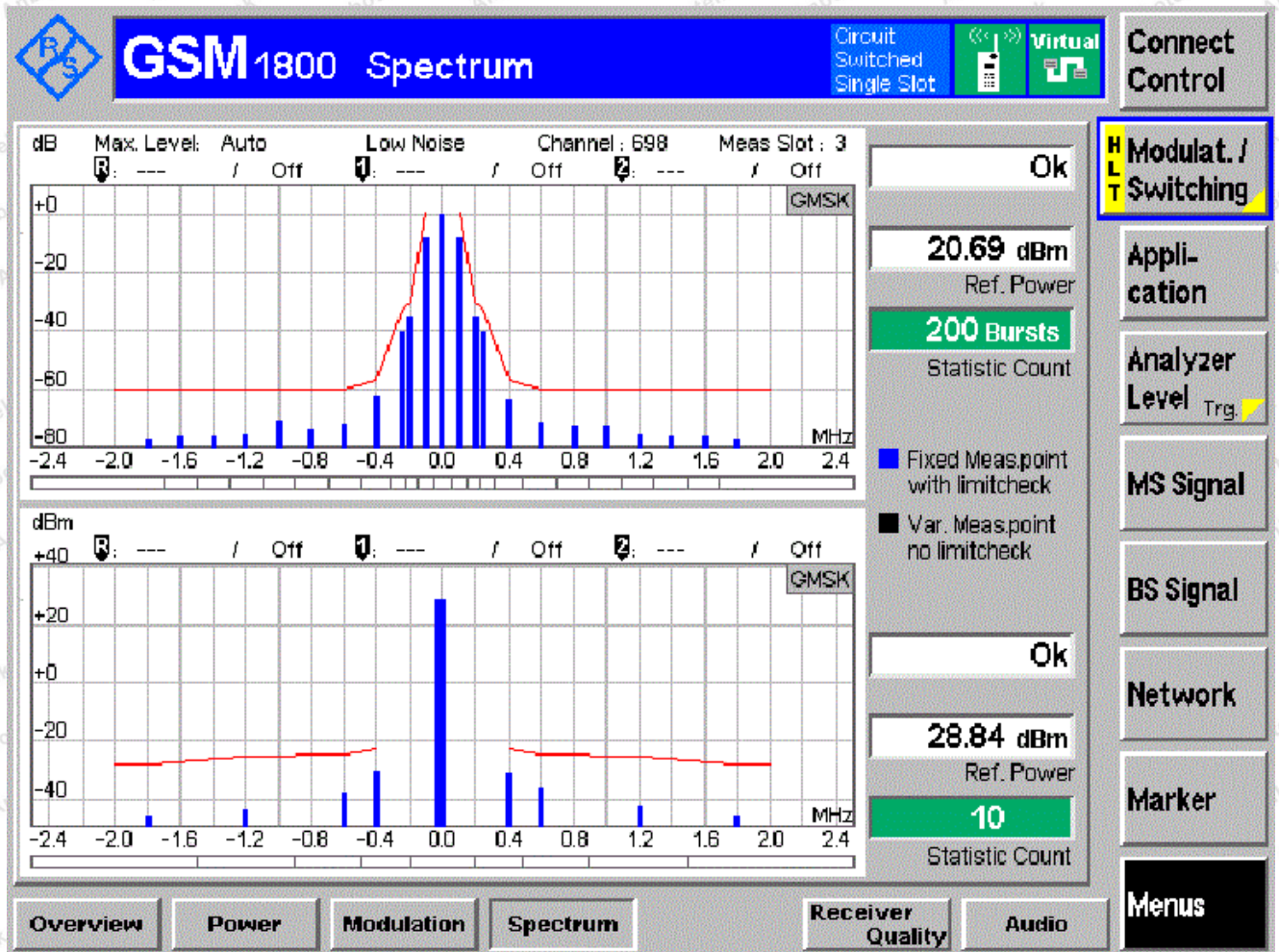
Channel HCH PCL 19



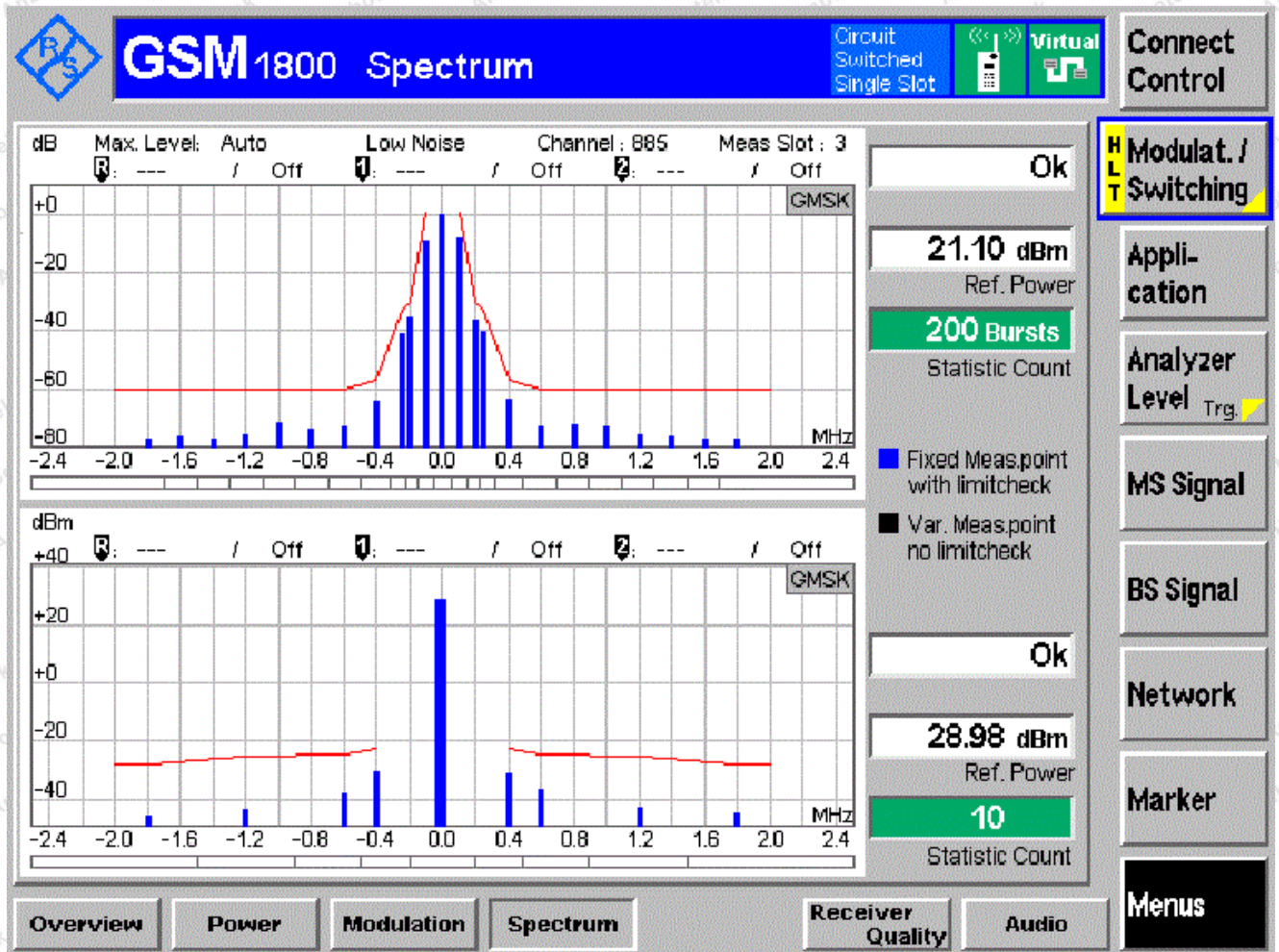
DCS1800 TN/VN
Channel LCH PCL 0



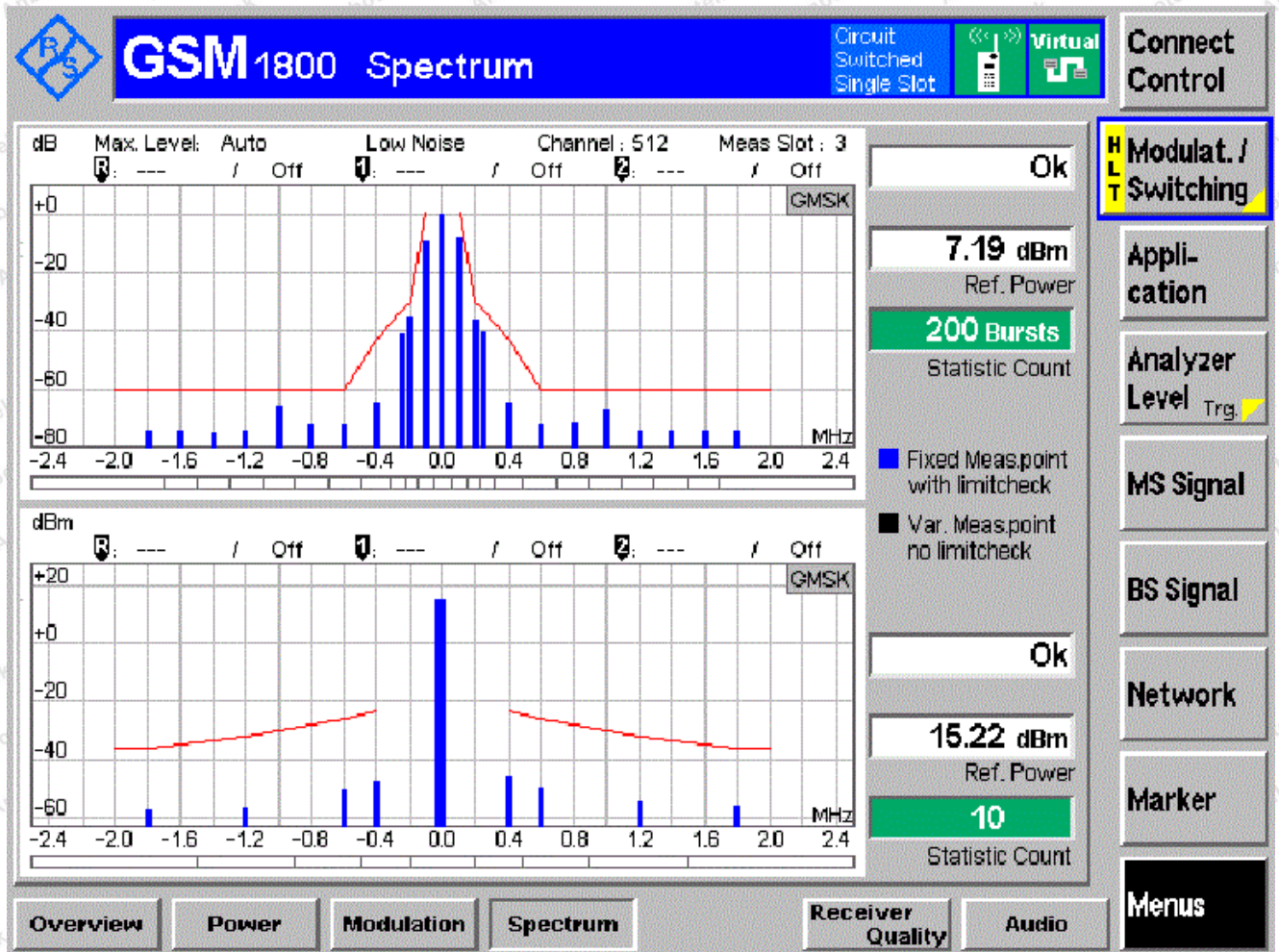
Channel MCH PCL 0



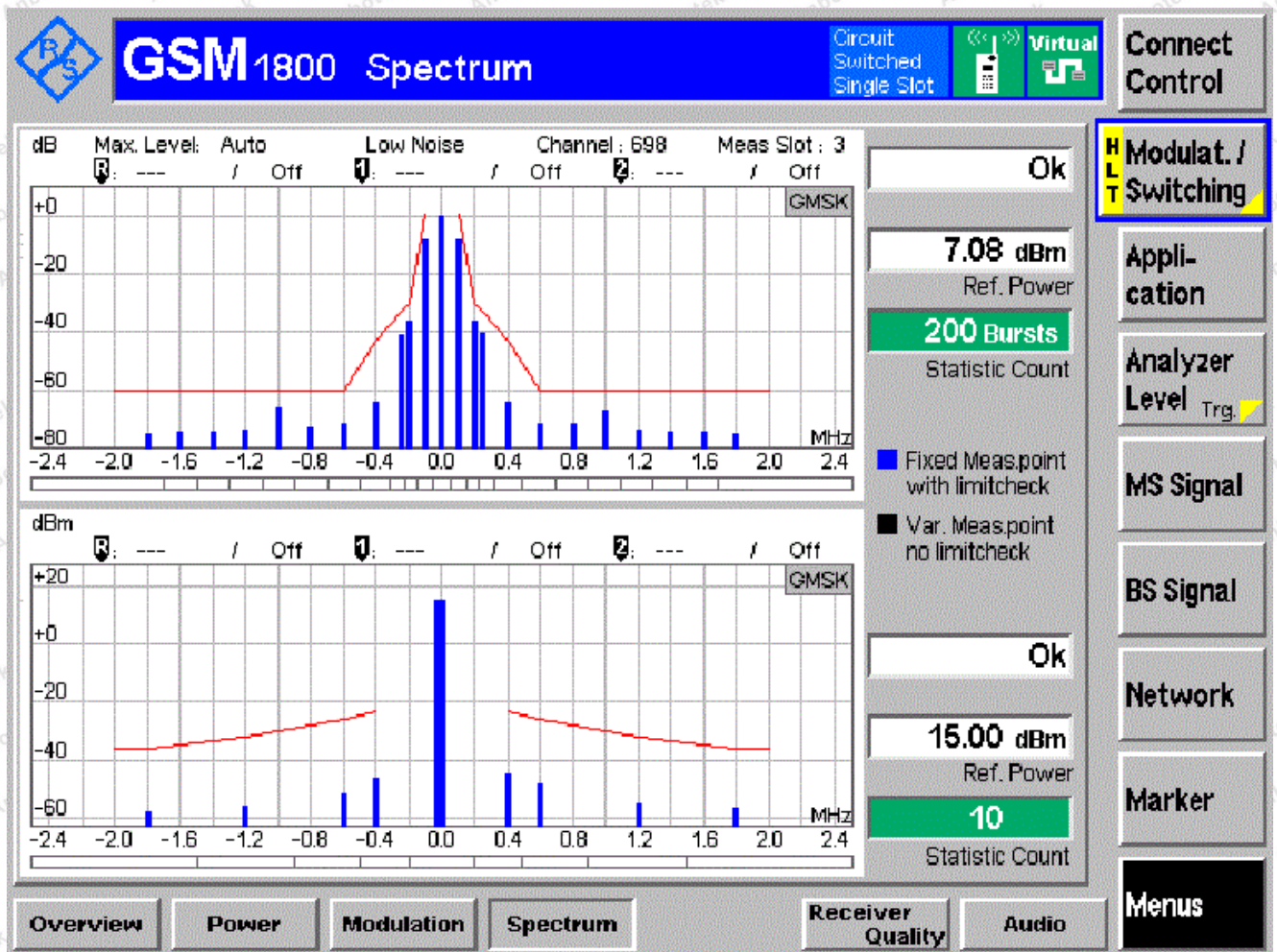
Channel HCH PCL 0



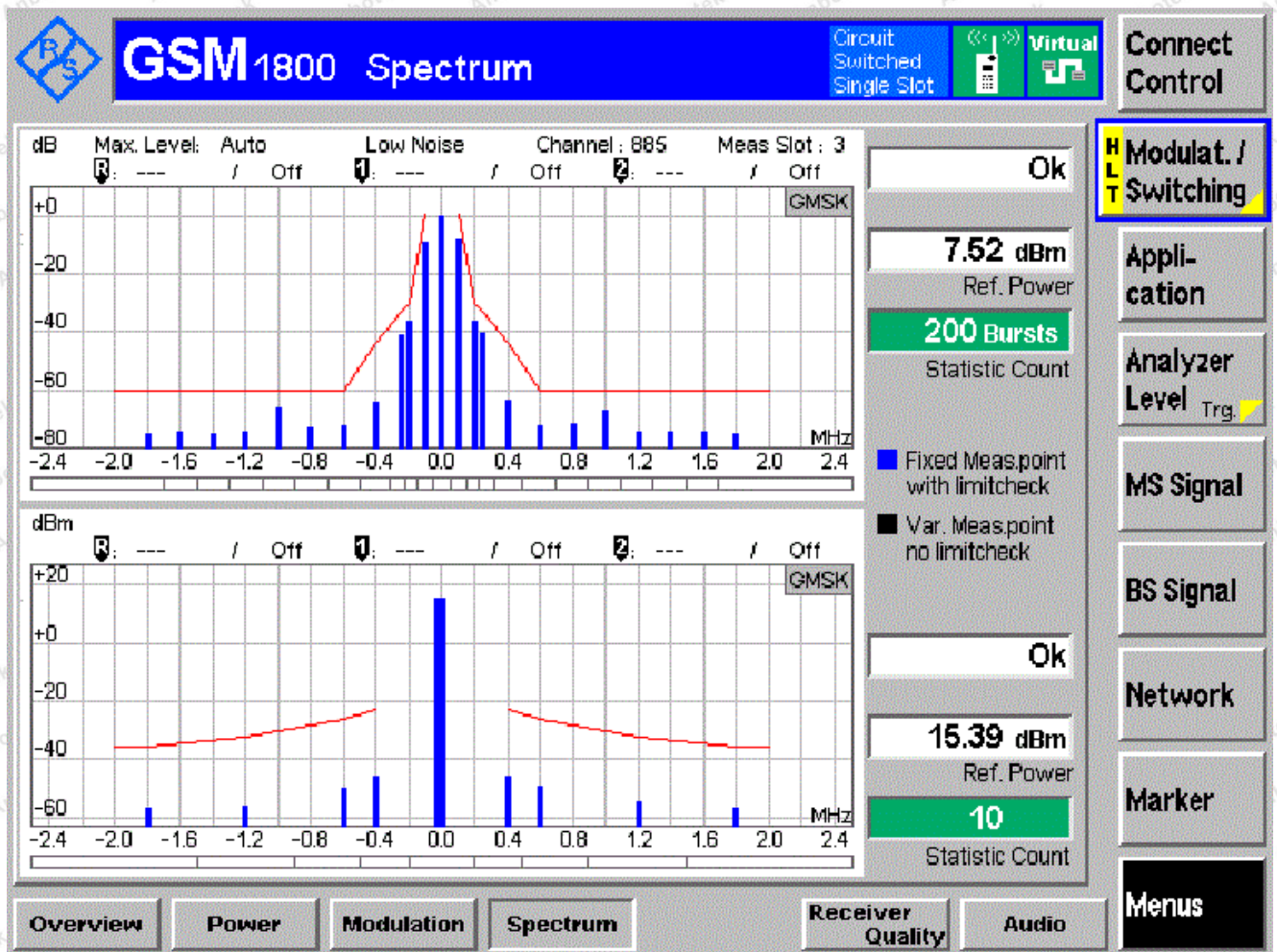
Channel LCH PCL 7



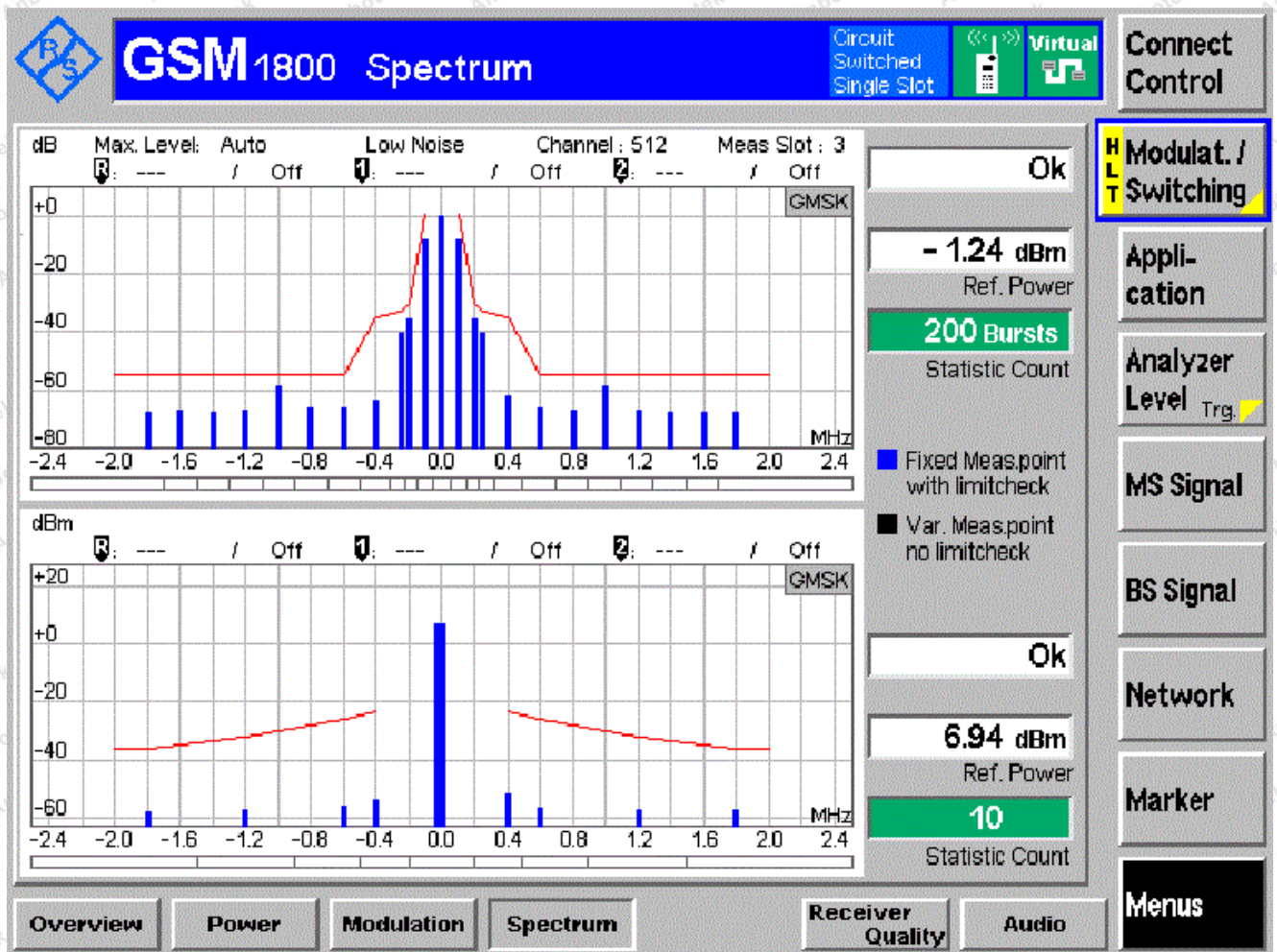
Channel MCH PCL 7



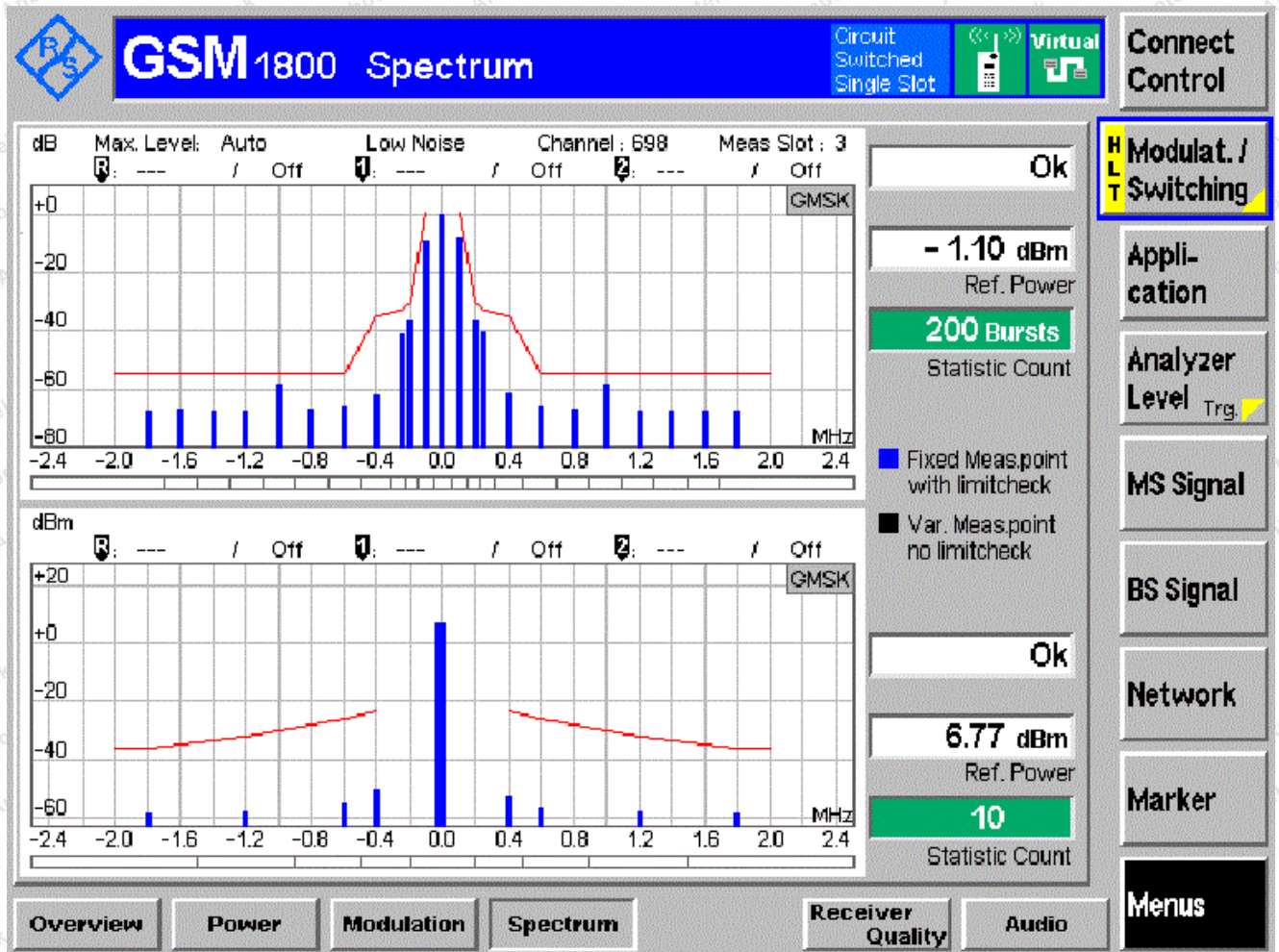
Channel HCH PCL 7



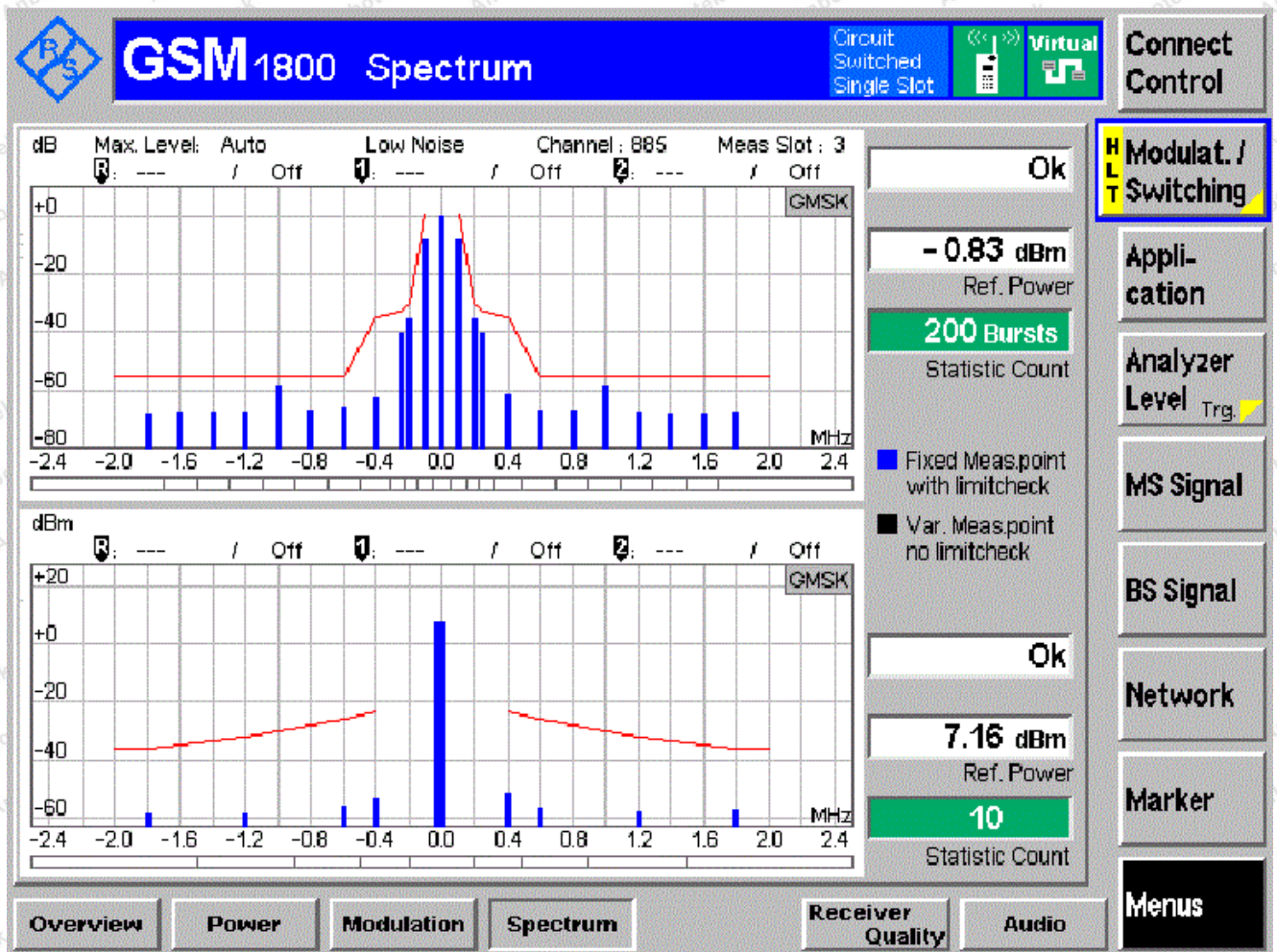
Channel LCH PCL 7



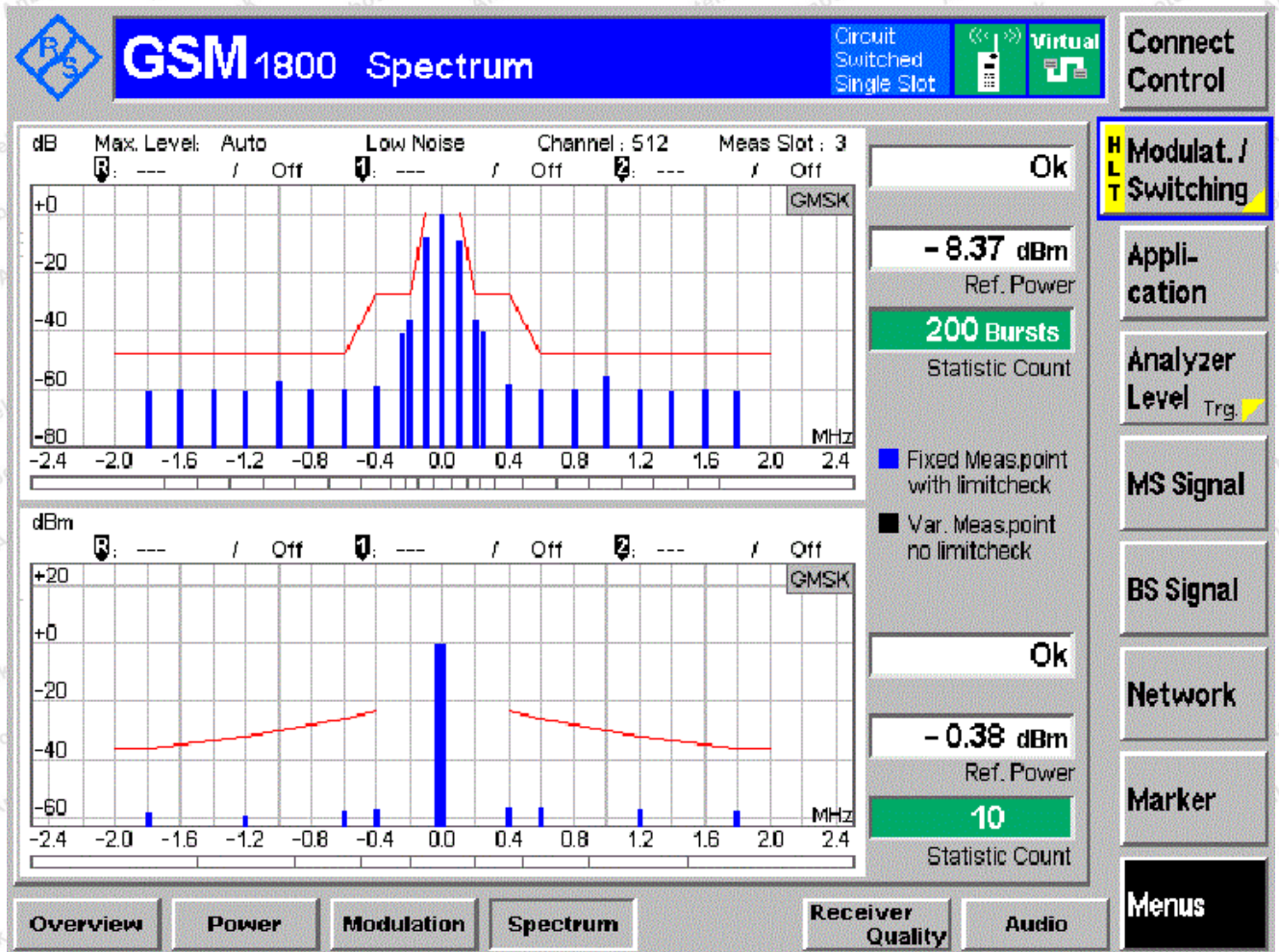
Channel MCH PCL 11



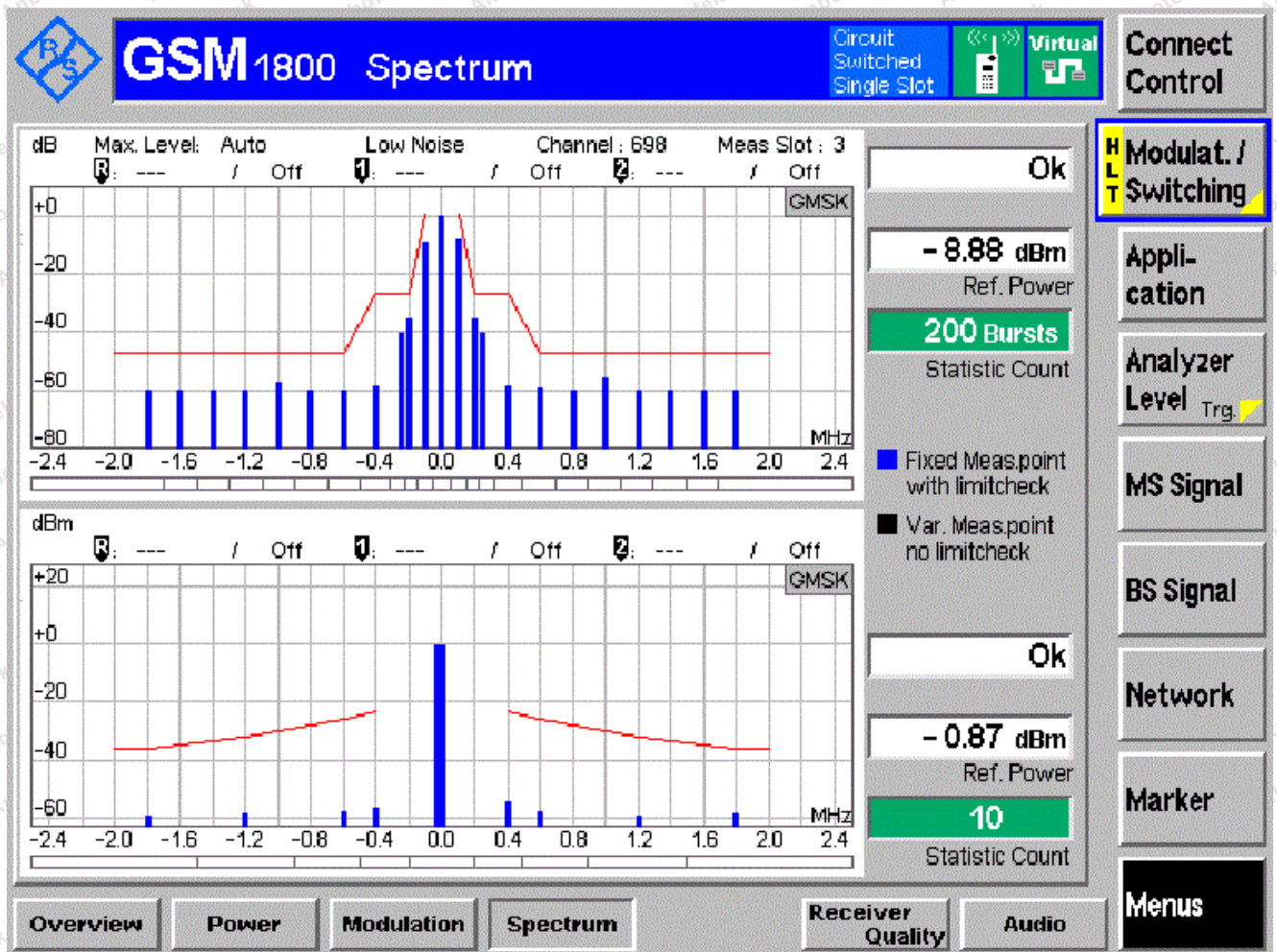
Channel HCH PCL 11



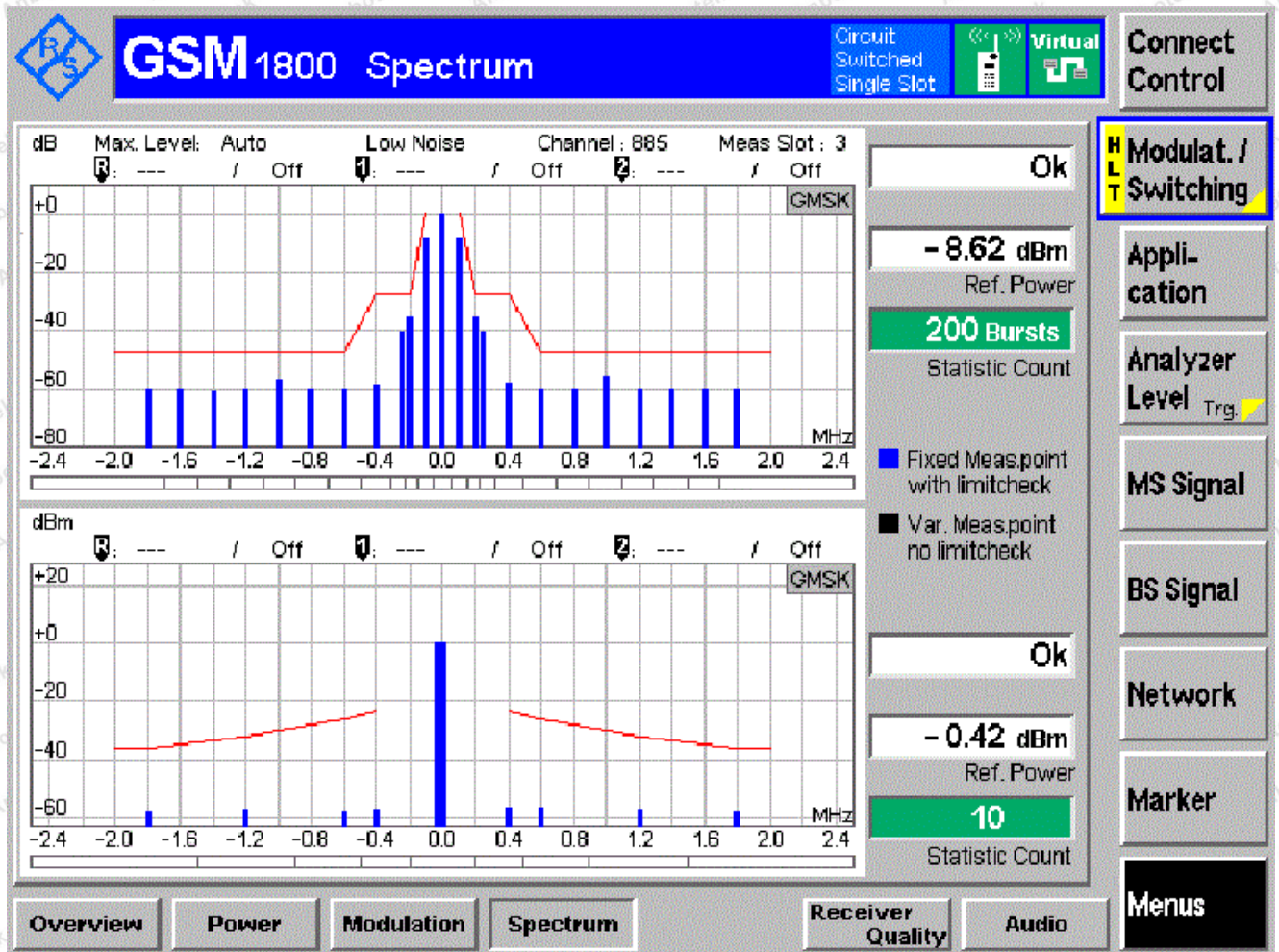
Channel LCH PCL 15



Channel MCH PCL 15



Channel HCH PCL 15

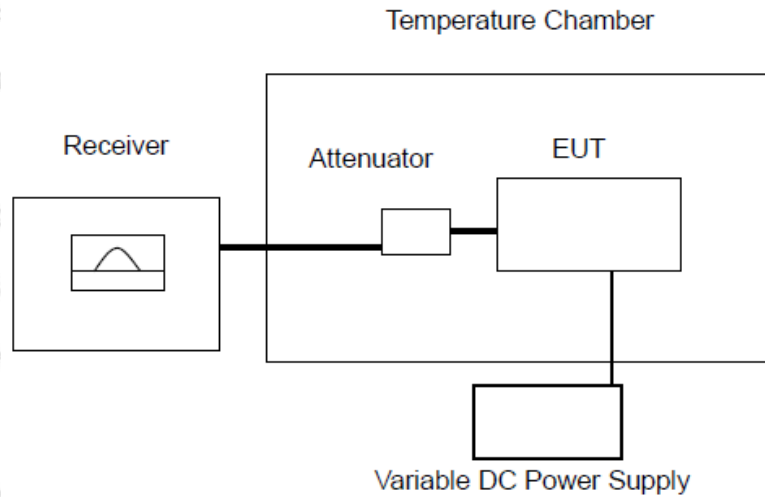


8. Transmitter Output Power in GPRS Multislo Configuration

8.1. Test Limit

Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.16.2.5

8.2. Test Setup



8.3. Test Procedure

1. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.16.2.3 for the test conditions.
2. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.16.2.4 for the measurement method..

8.4. Test Result

| | | | |
|--------------|----------|--------------------|------------------------|
| Temperature: | 25° C | Relative Humidity: | 63 % |
| Pressure: | 1012 hPa | Test Voltage: | DC 3.7V Battery inside |

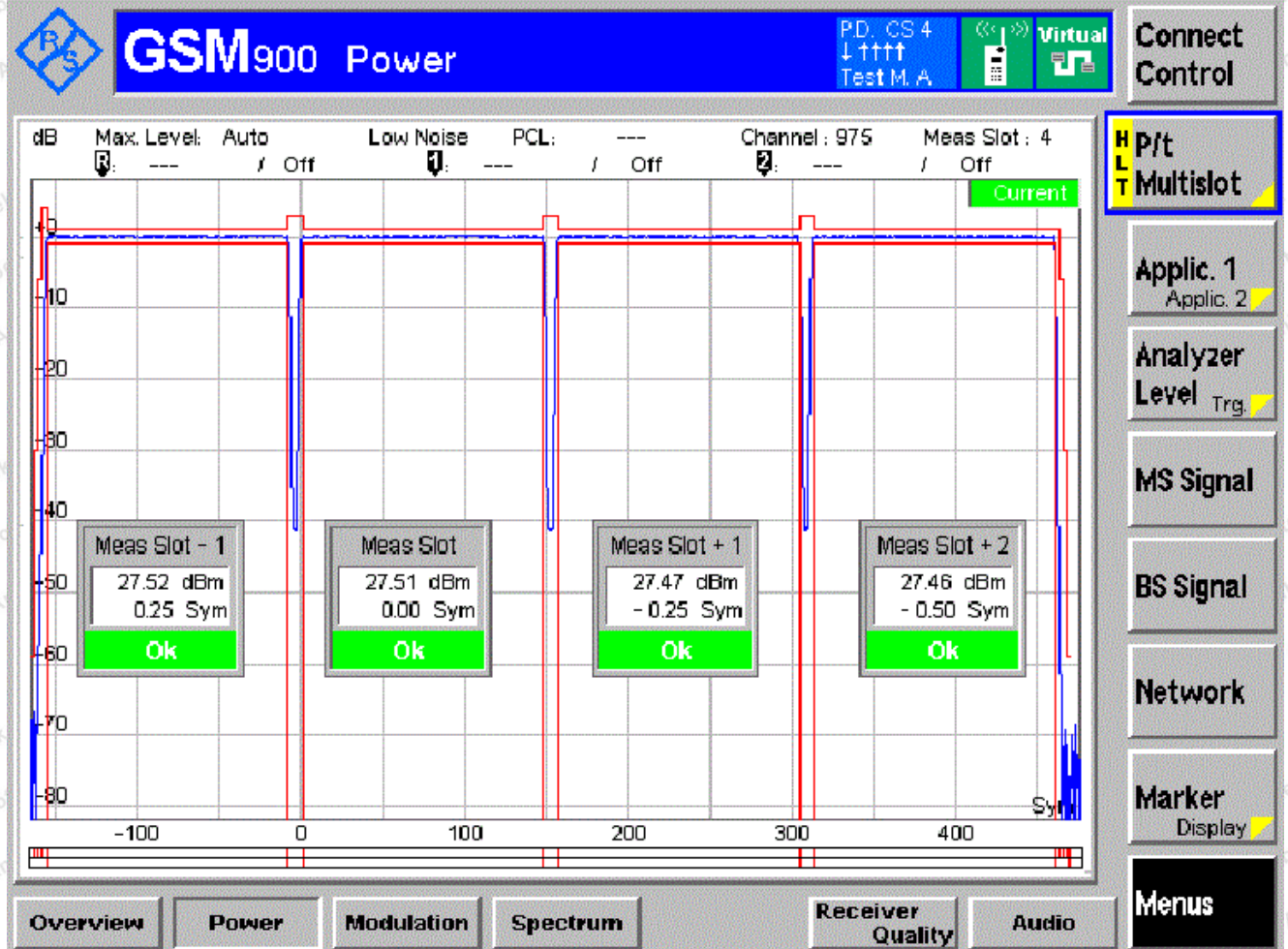
| Transmitter Output power(dBm) | Power level | Result | | | |
|----------------------------------|----------------|------------------|-------|-------|--------|
| | | Traffic Channels | | | |
| GSM900 | | LCH | MCH | HCH | Result |
| TN/VN | 5 | 27.54 | 27.70 | 27.57 | PASS |
| | 12 | 17.10 | 17.38 | 17.22 | PASS |
| | 19 | 4.24 | 4.18 | 4.38 | PASS |

| Transmitter Output power(dBm) | Power level | Result | | | |
|----------------------------------|-------------|------------------|-------|-------|--------|
| | | Traffic Channels | | | |
| DCS1800 | | LCH | MCH | HCH | Result |
| TN/VN | 0 | 25.19 | 24.93 | 25.41 | PASS |
| | 8 | 12.64 | 12.16 | 12.60 | PASS |
| | 15 | -0.46 | -0.95 | -0.47 | PASS |

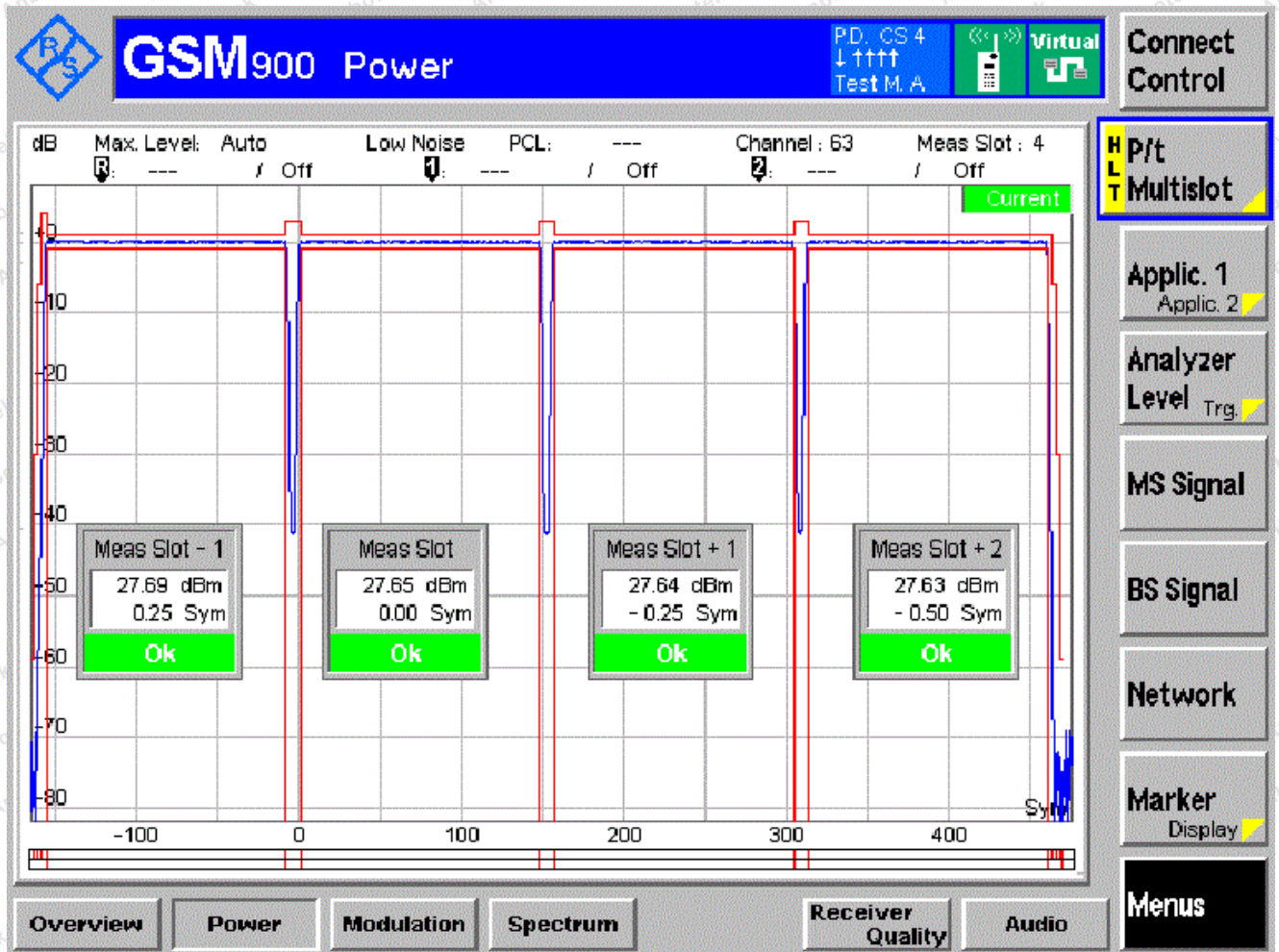
NT/NV Condition:

GSM 900 TN/VN

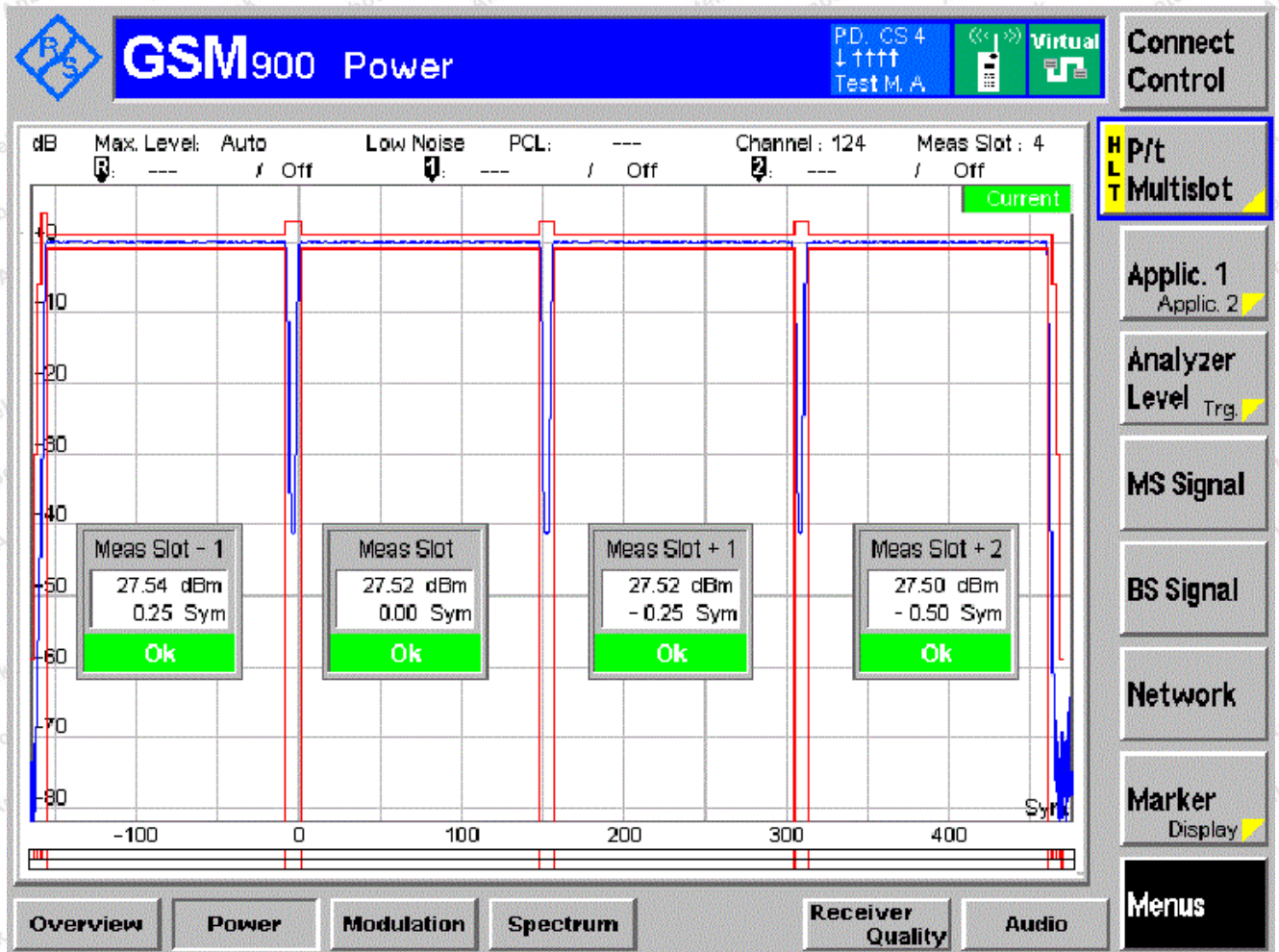
Channel LCH PCL 5



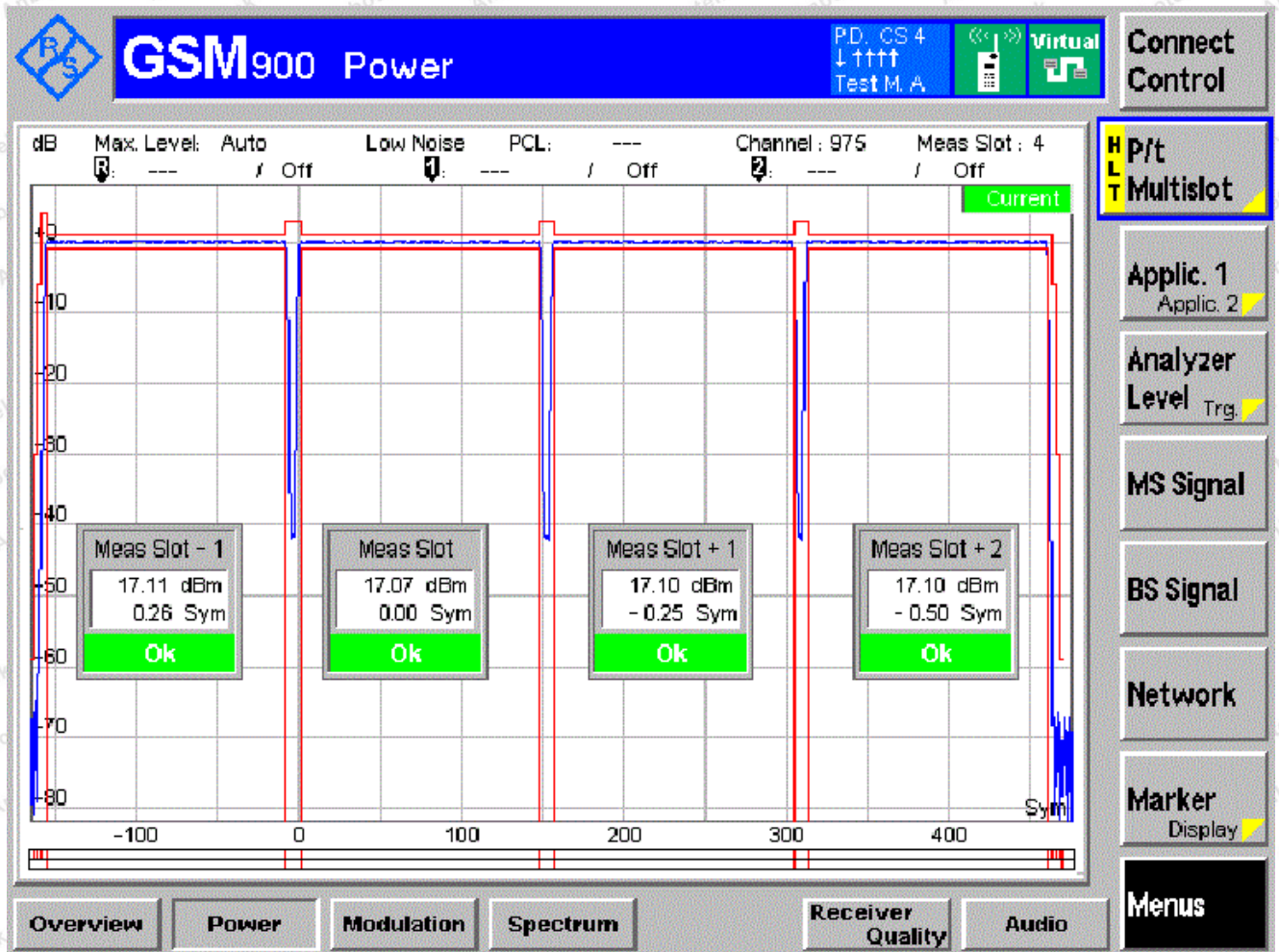
Channel MCH PCL 5



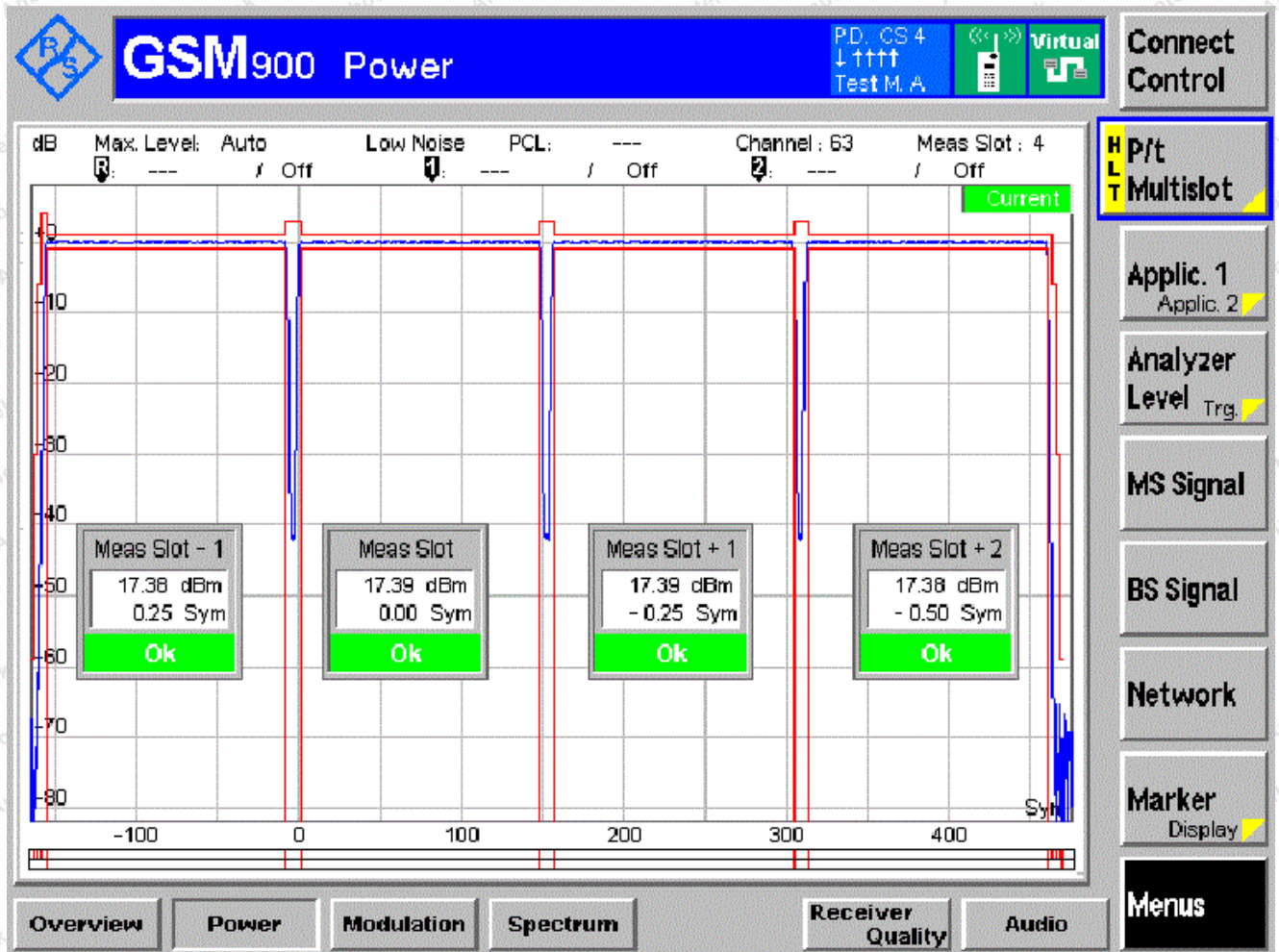
Channel HCH PCL 5



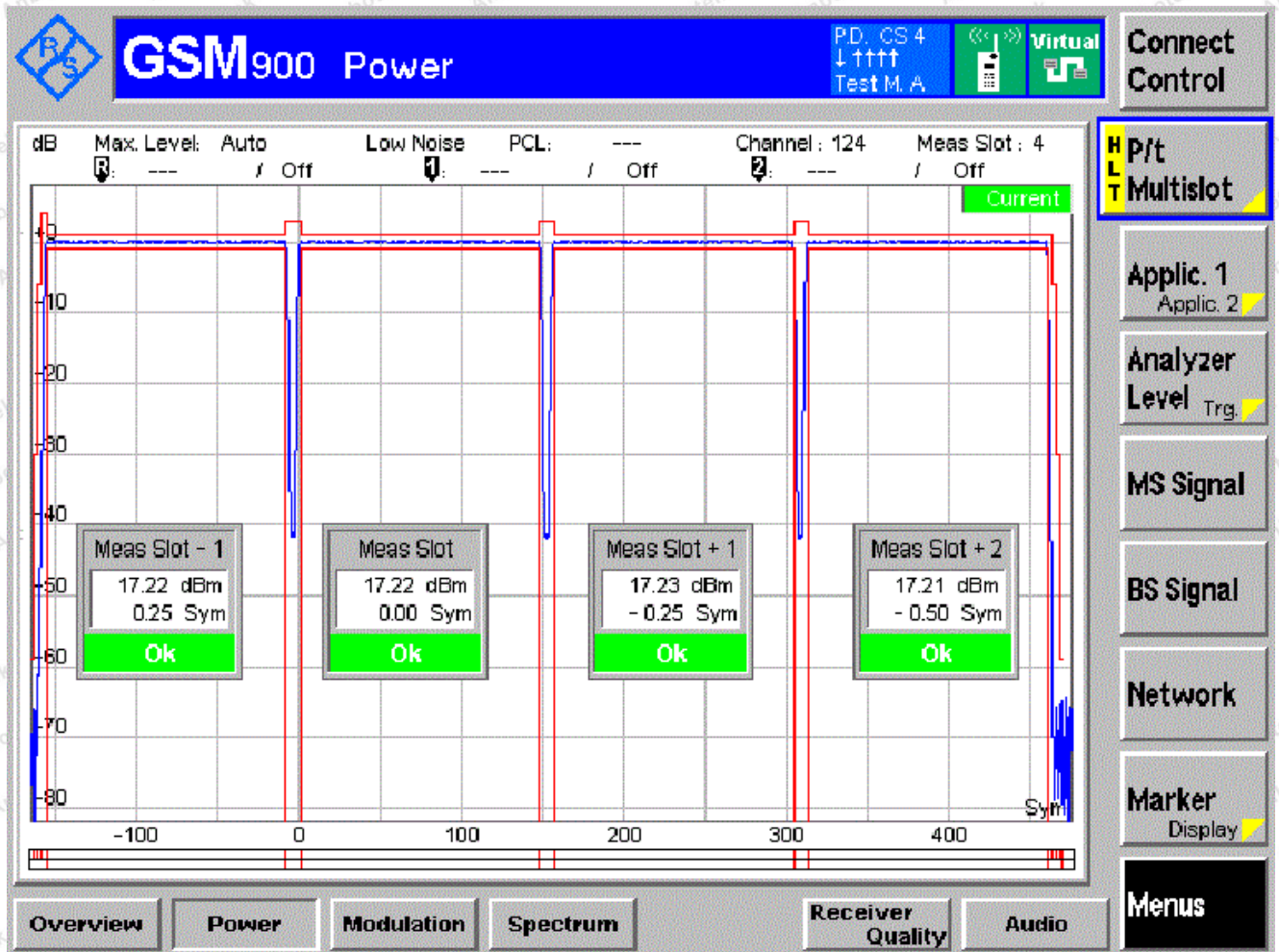
Channel LCH PCL 12



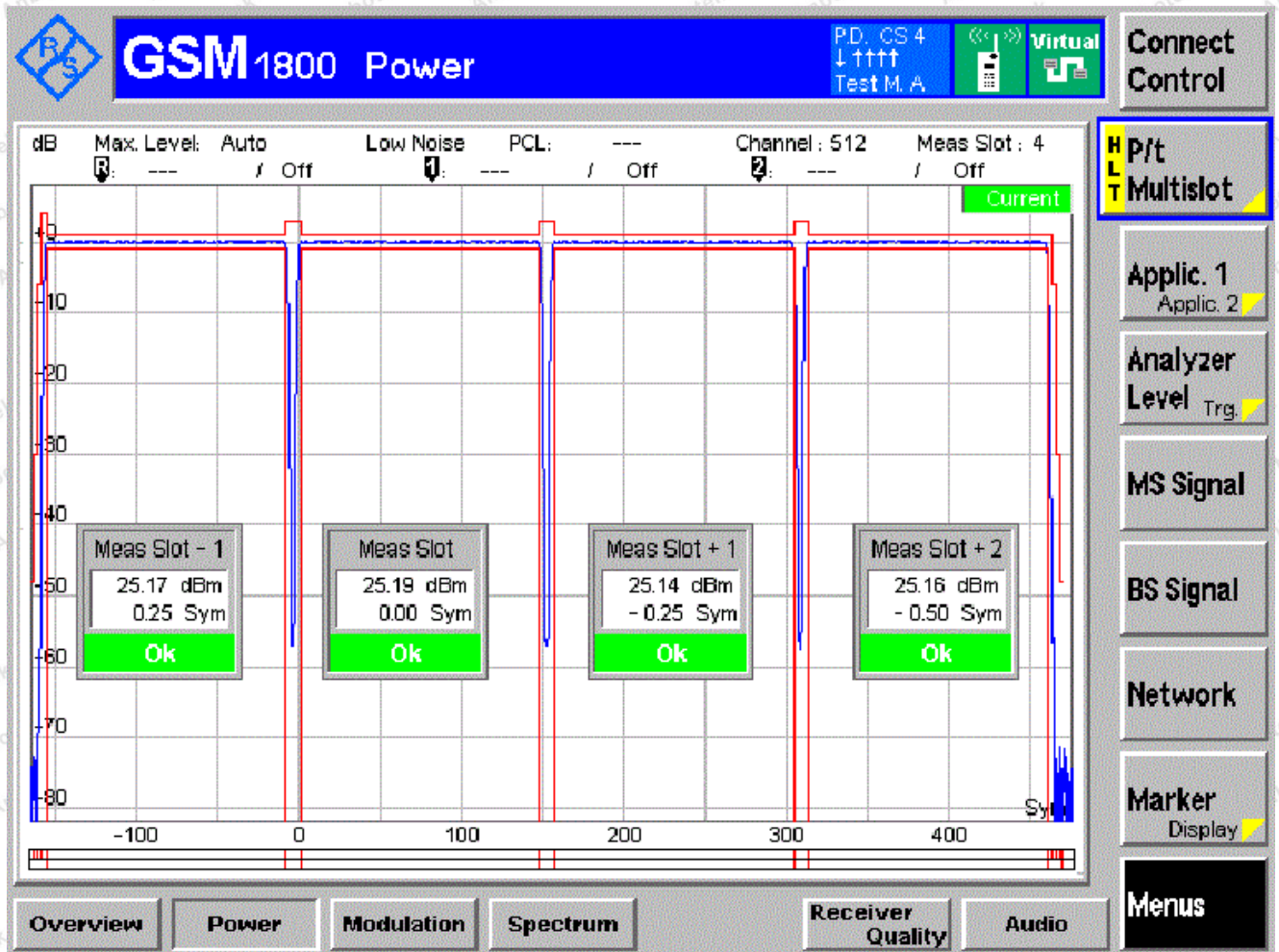
Channel MCH PCL 12



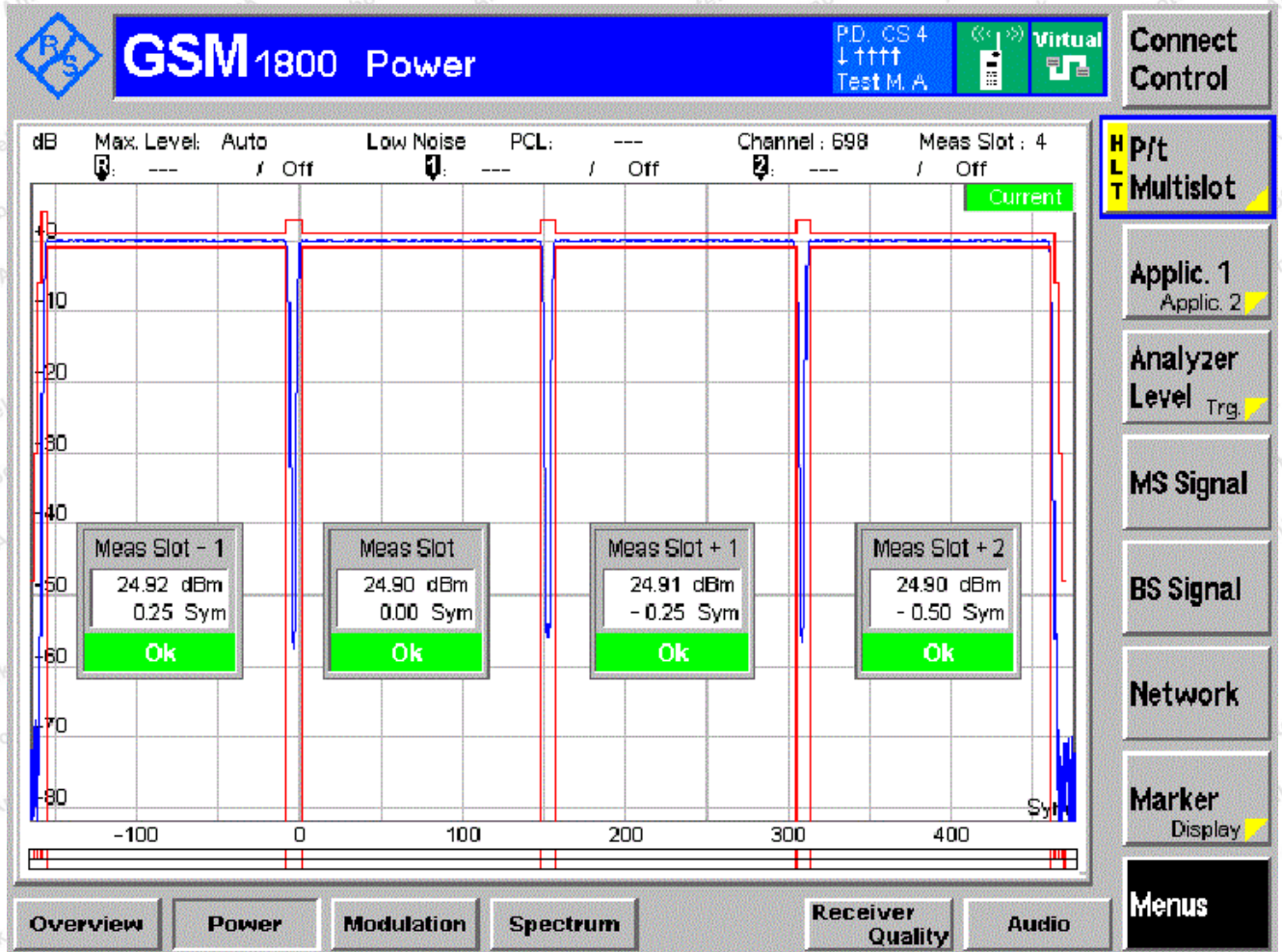
Channel HCH PCL 12



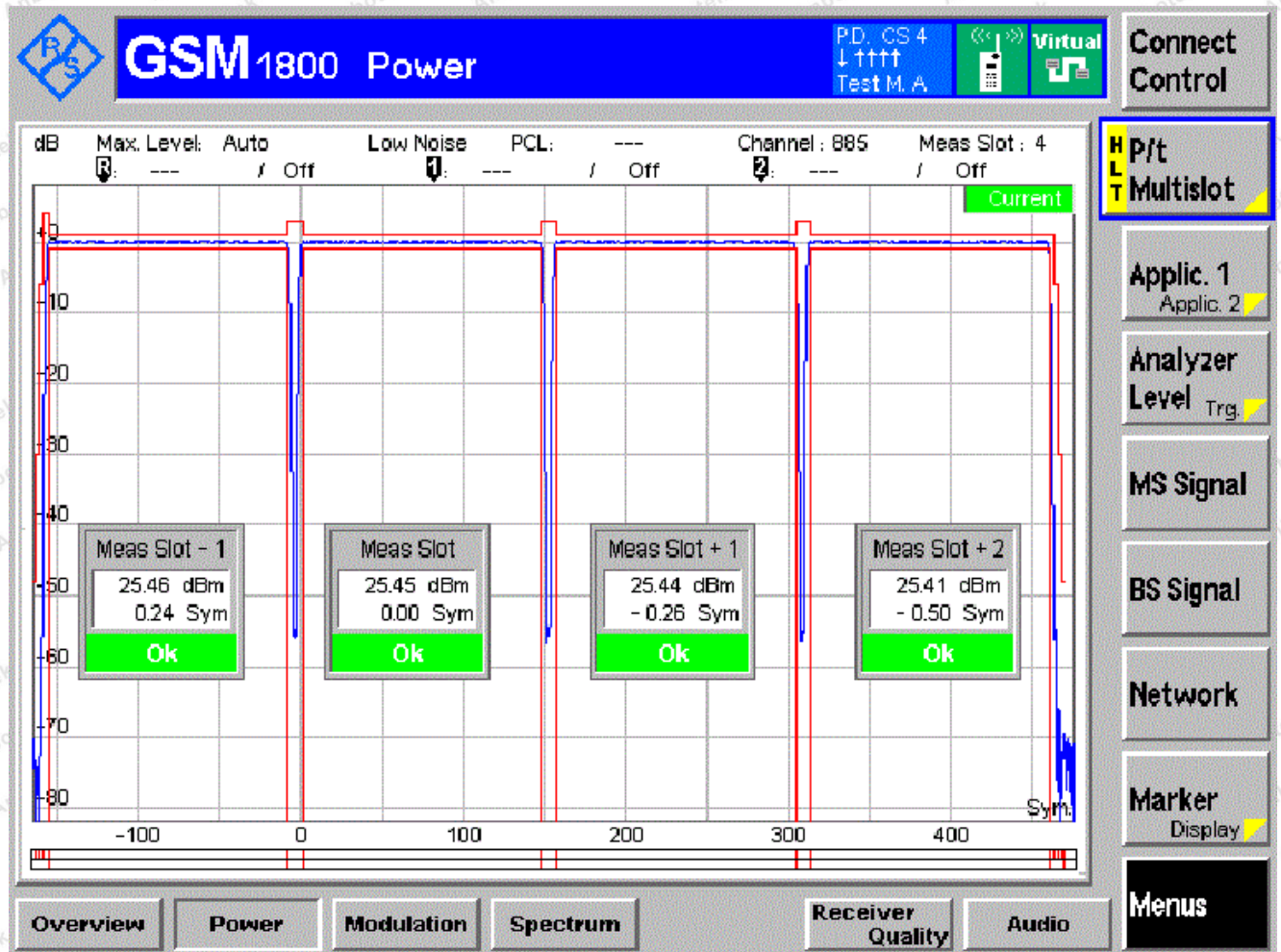
a) DCS1800 TN/VN
Channel LCH PCL 0



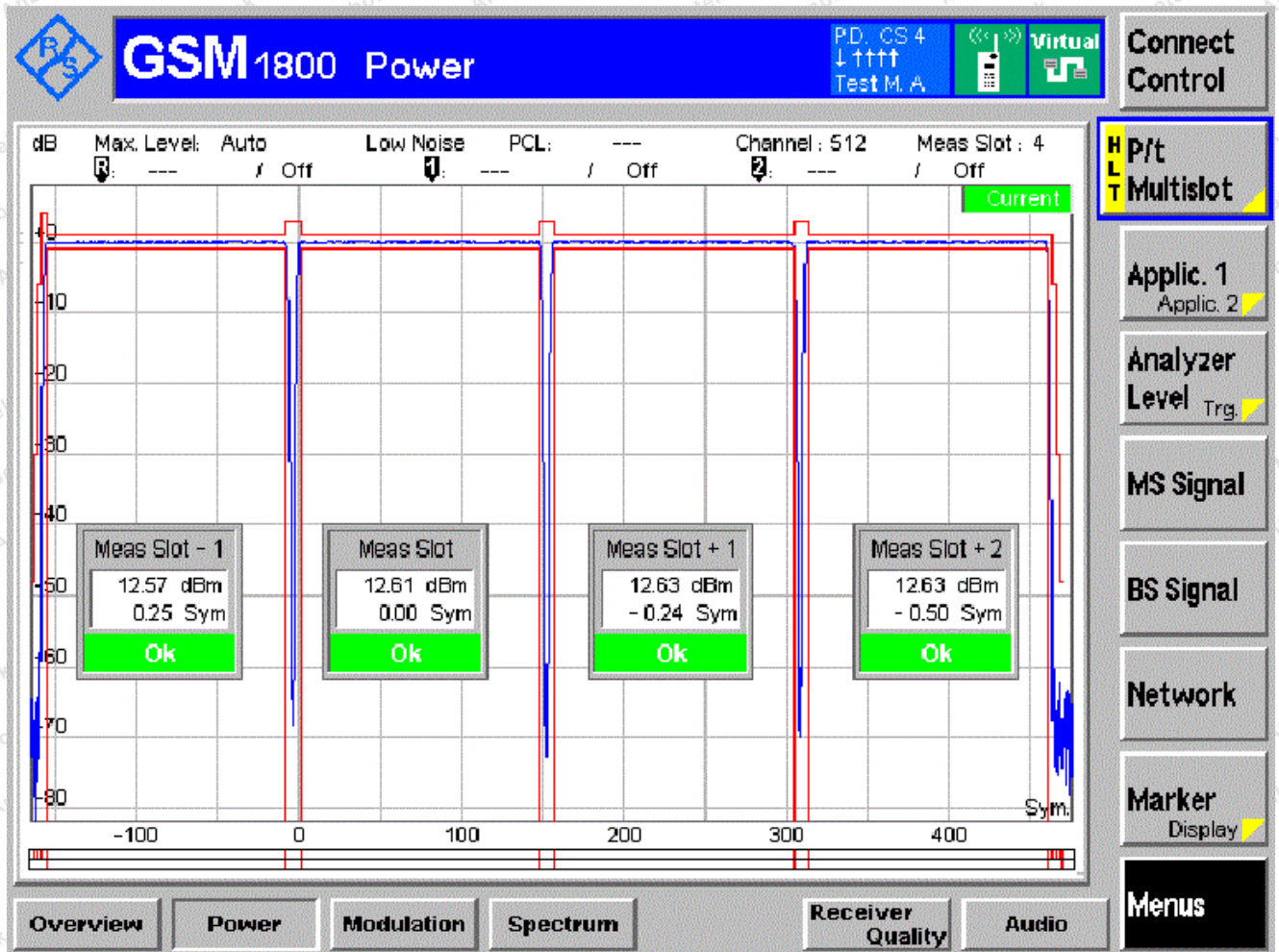
Channel MCH PCL 0



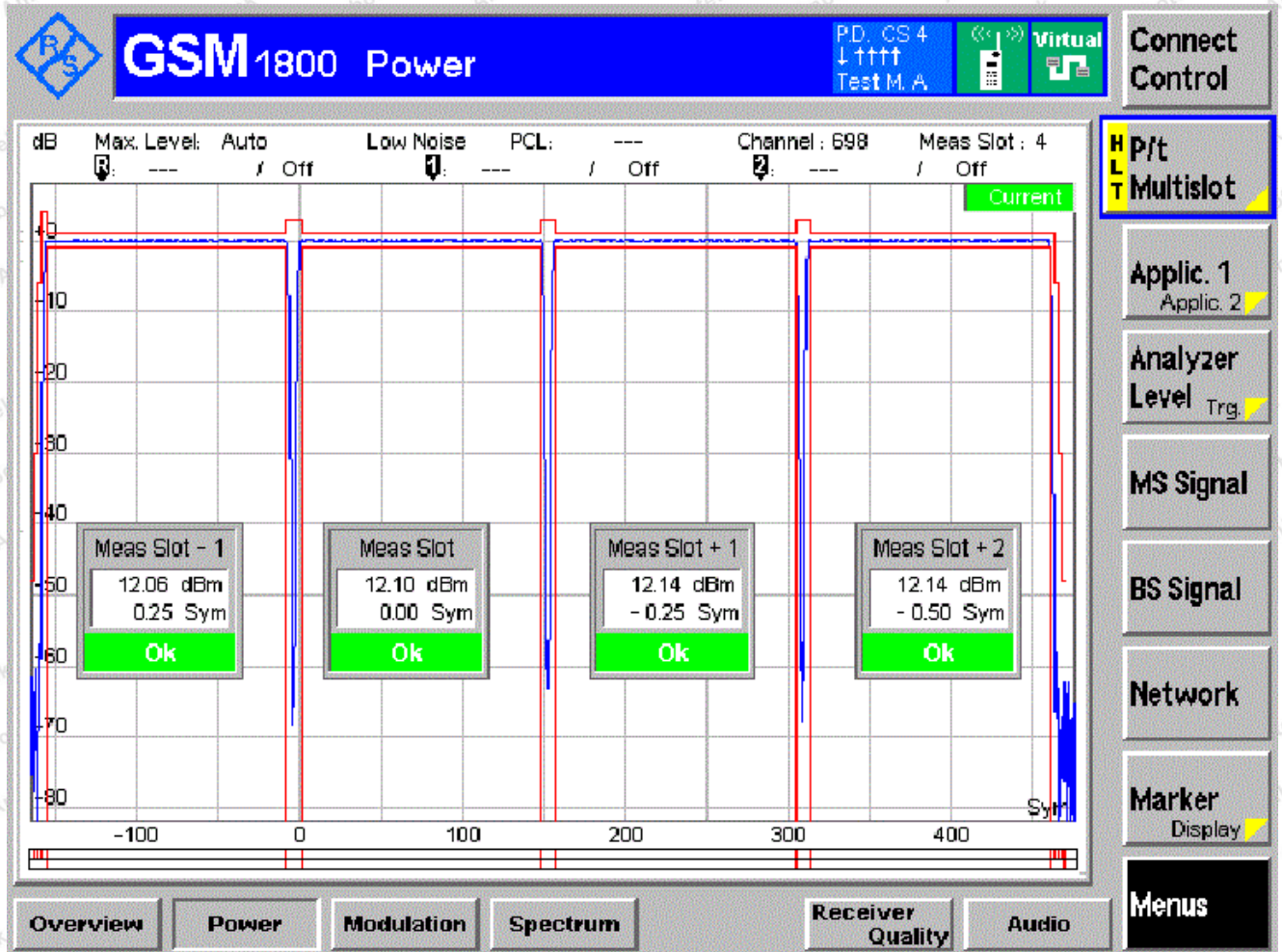
Channel HCH PCL 0



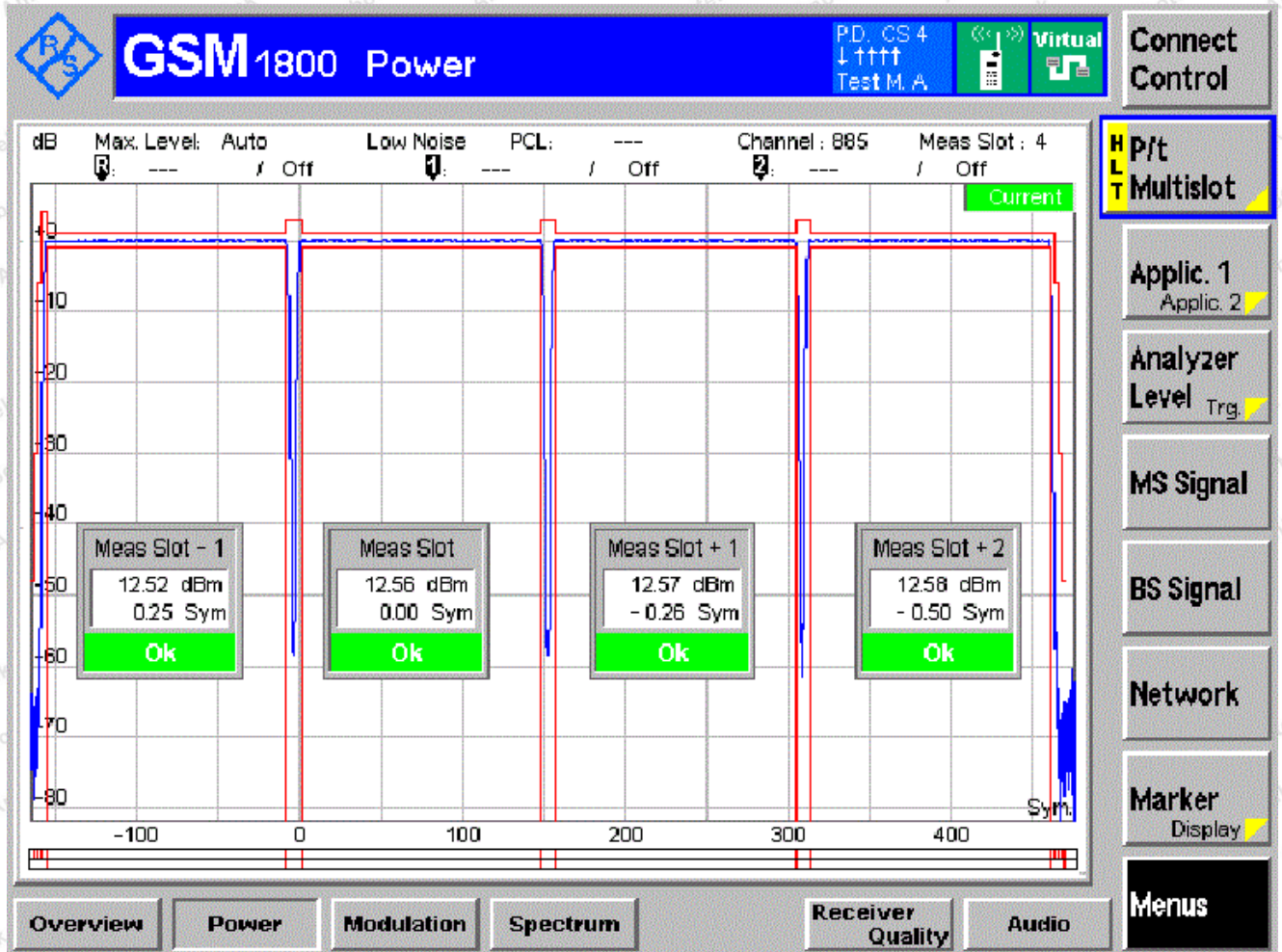
Channel LCH PCL 8



Channel MCH PCL 8



Channel HCH PCL 8

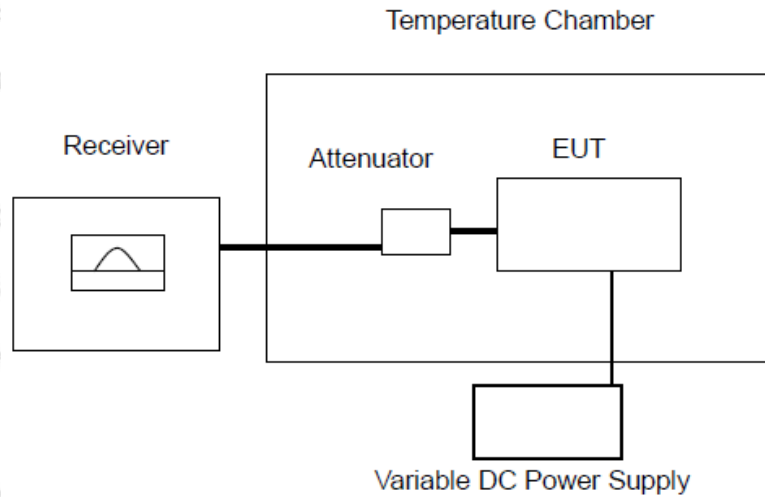


9. Output RF Spectrum in GPRS Multislot Configuration

9.1. Test Limit

Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.16.3.5

9.2. Test Setup



9.3. Test Procedure

1. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.16.3.3 for the test conditions.
2. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.16.3.4 for the measurement method.

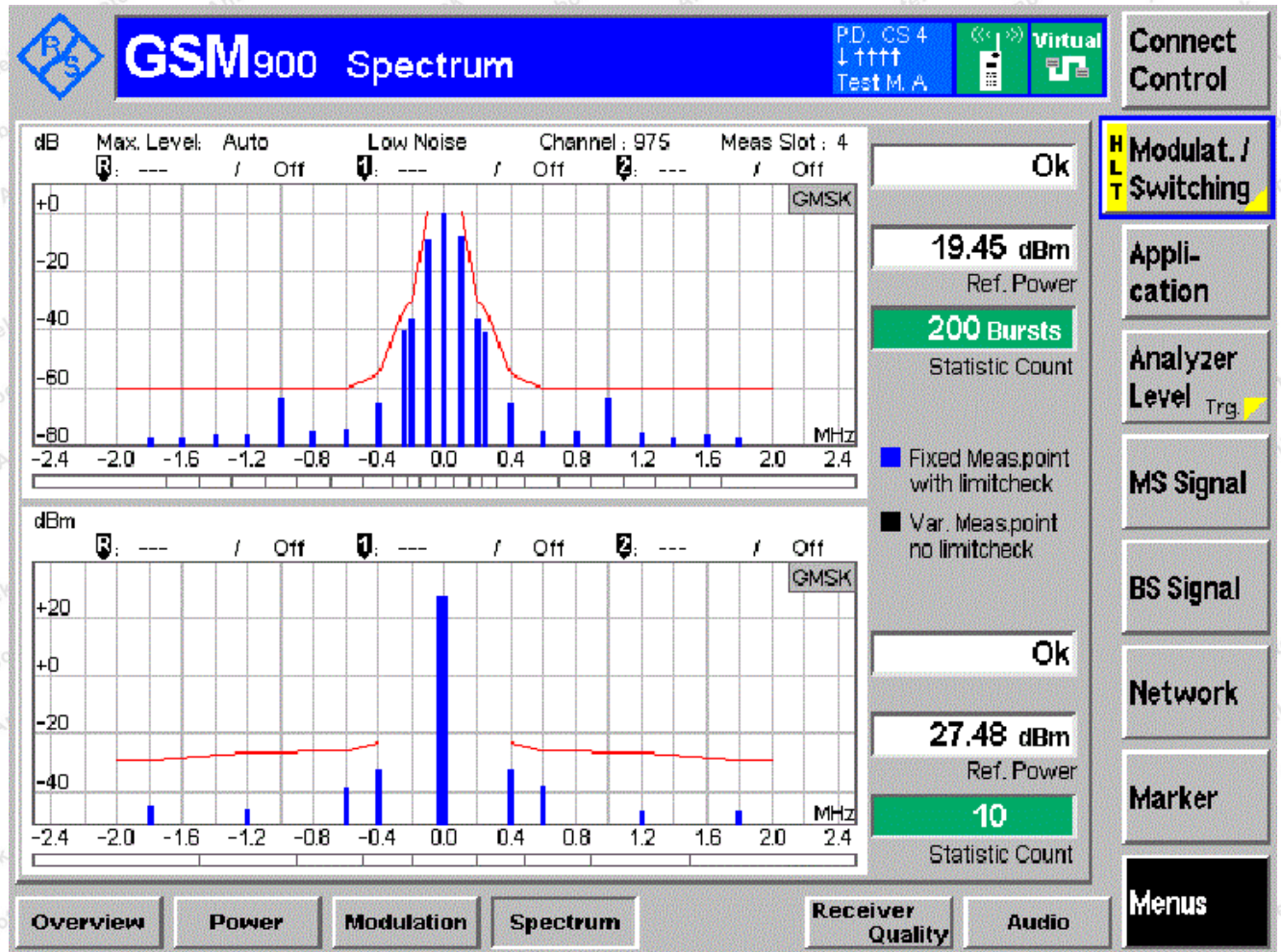
9.4. Test Result

| | | | |
|--------------|----------|--------------------|------------------------|
| Temperature: | 25° C | Relative Humidity: | 63 % |
| Pressure: | 1012 hPa | Test Voltage: | DC 3.7V Battery inside |

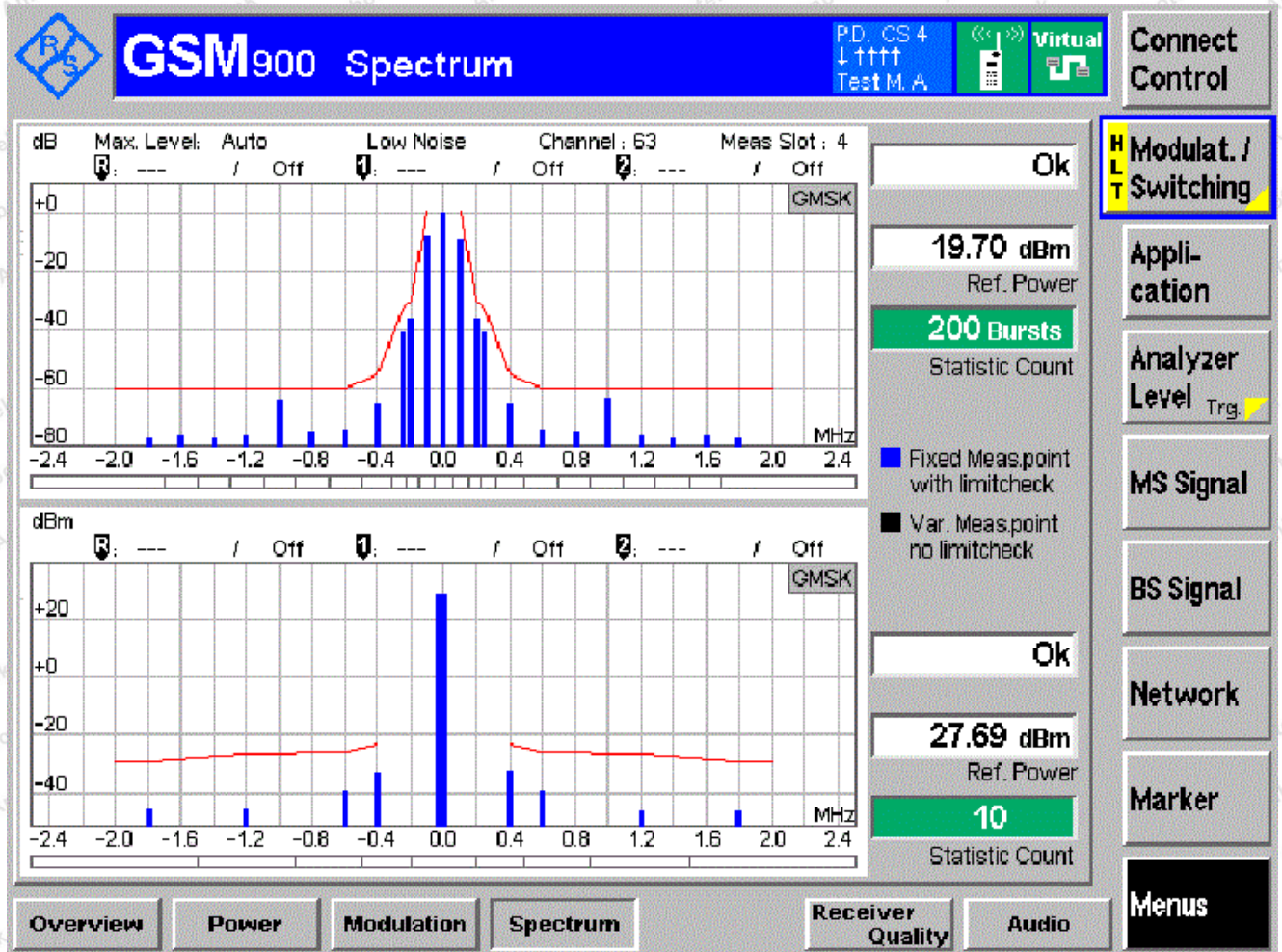
| Modulation& switch Spectrum | Power level | Result | | |
|--------------------------------|-------------|------------------|------|------|
| | | Traffic Channels | | |
| GSM900 | | LCH | MCH | HCH |
| TN/VN | 5 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 19 | PASS | PASS | PASS |
| TL/VL | 5 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 19 | PASS | PASS | PASS |
| TL/VH | 5 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 19 | PASS | PASS | PASS |
| TH/VL | 5 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 19 | PASS | PASS | PASS |
| TH/VH | 5 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 19 | PASS | PASS | PASS |

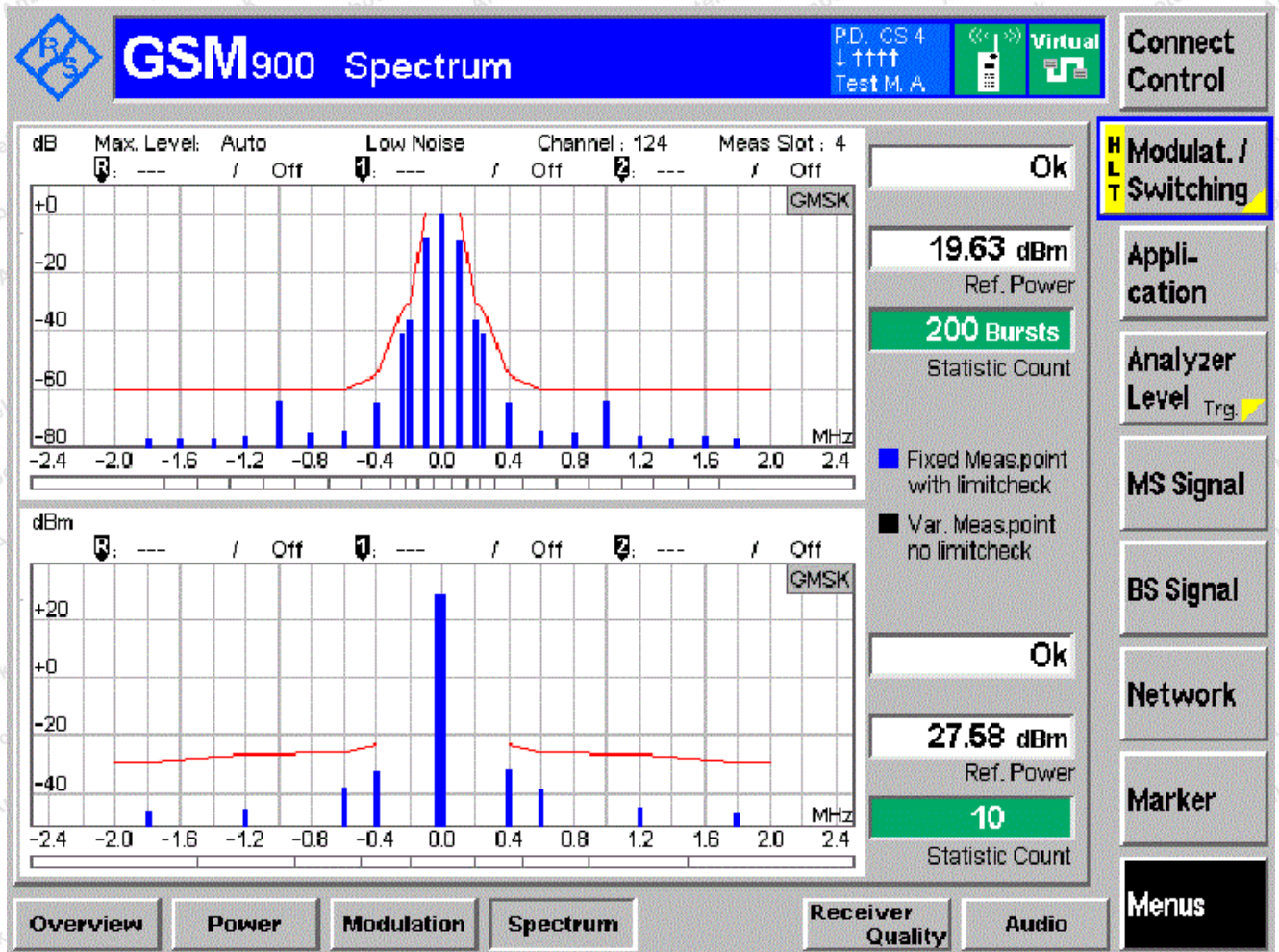
| Modulation& switch Spectrum | Power level | Result | | |
|--------------------------------|-------------|------------------|------|------|
| | | Traffic Channels | | |
| DCS1800 | | LCH | MCH | HCH |
| TN/VN | 0 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 15 | PASS | PASS | PASS |
| TL/VL | 0 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 15 | PASS | PASS | PASS |
| TL/VH | 0 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 15 | PASS | PASS | PASS |
| TH/VL | 0 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 15 | PASS | PASS | PASS |
| TH/VH | 0 | PASS | PASS | PASS |
| | 7 | PASS | PASS | PASS |
| | 11 | PASS | PASS | PASS |
| | 15 | PASS | PASS | PASS |

a) GSM 900 TN/VN
Channel LCH PCL 5

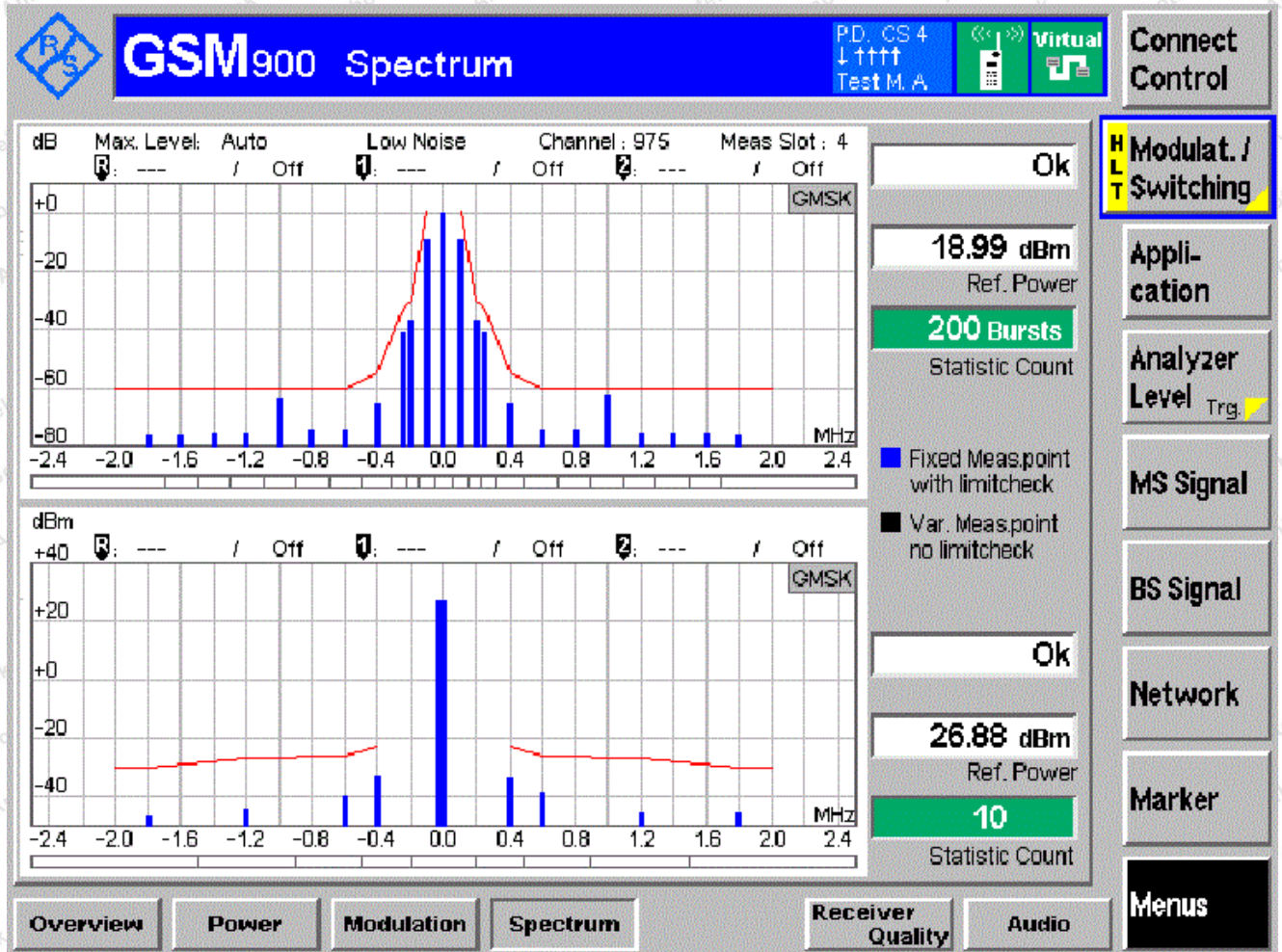


Channel MCH PCL 5

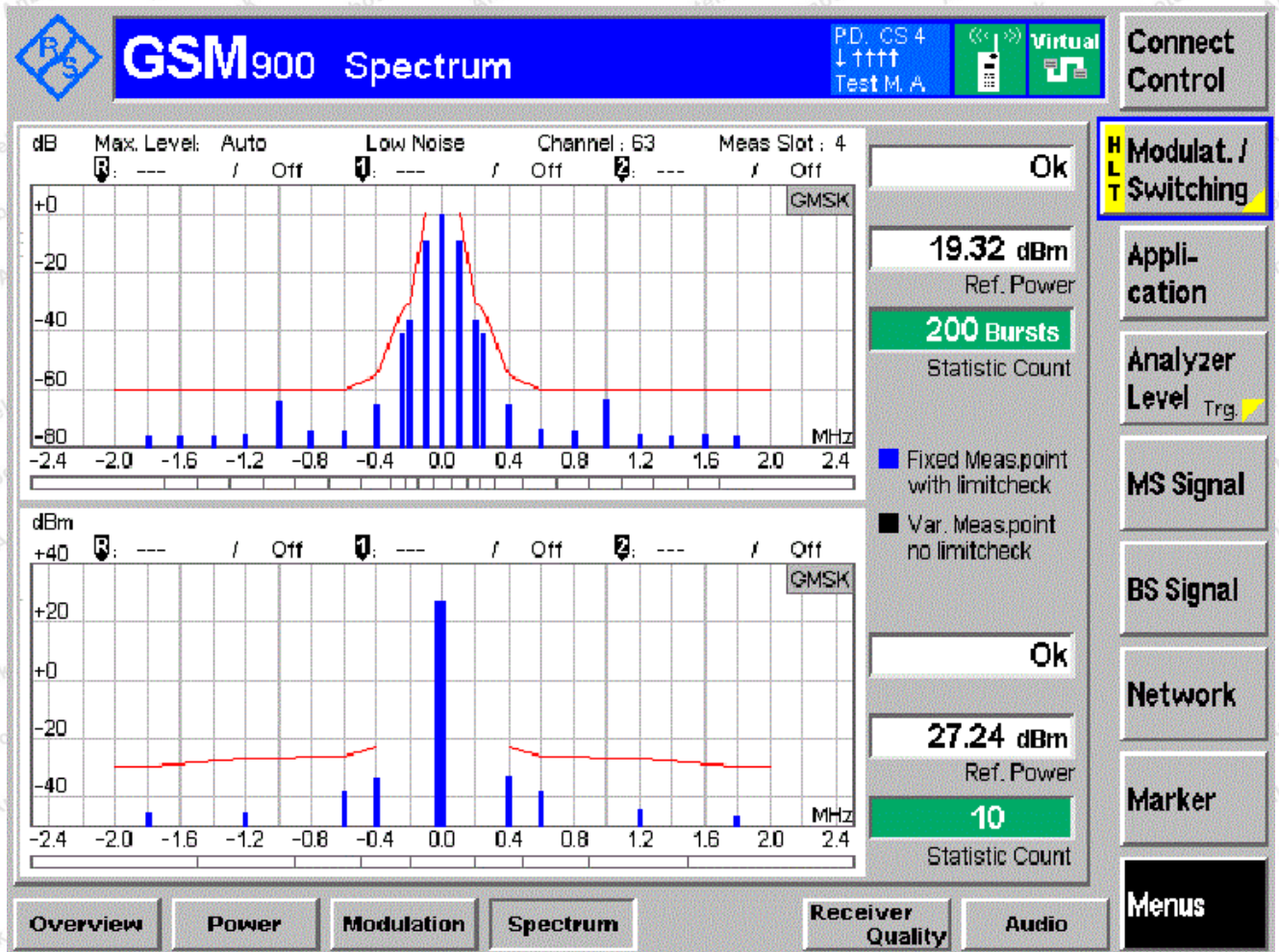




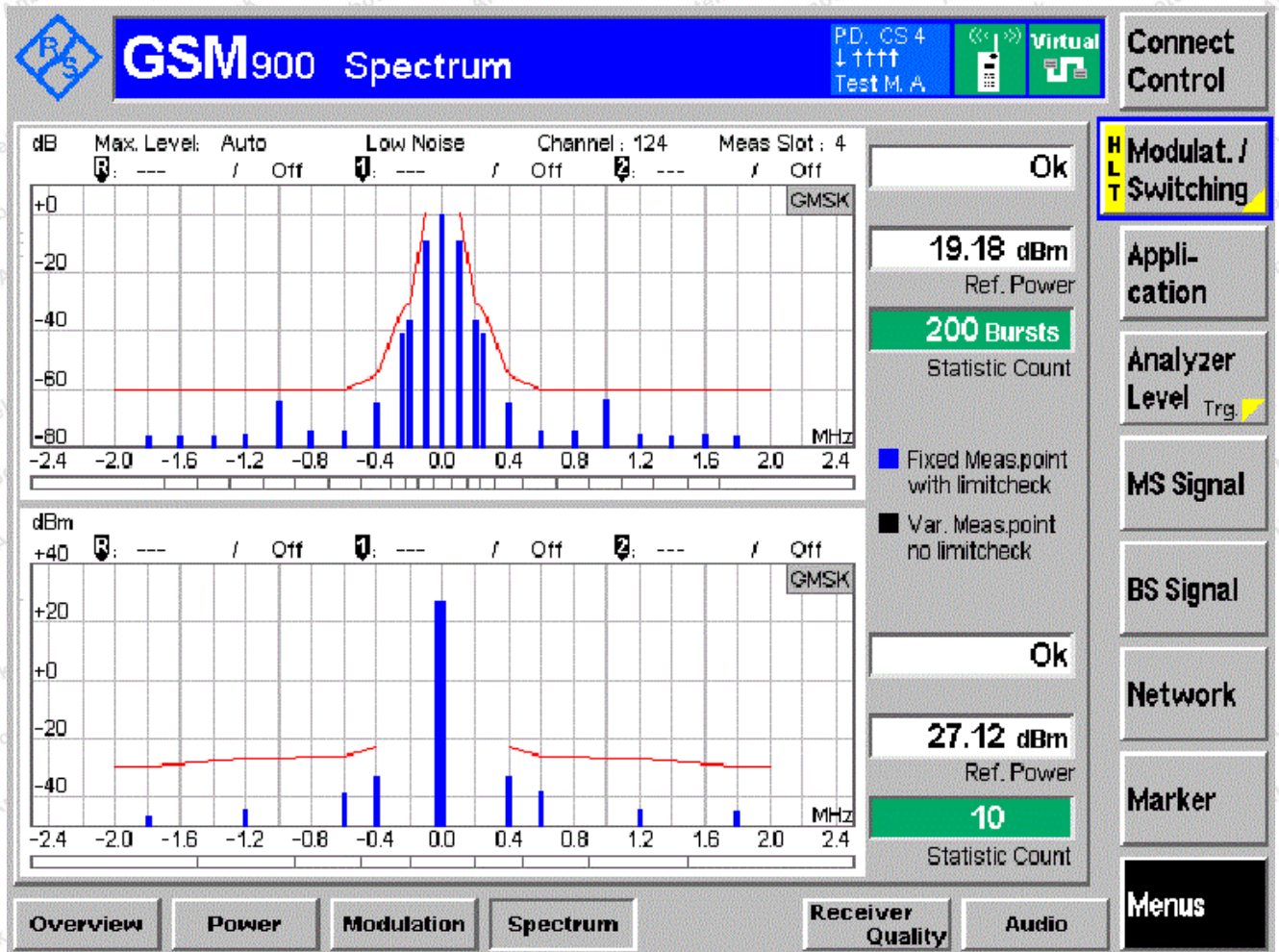
Channel LCH PCL 7



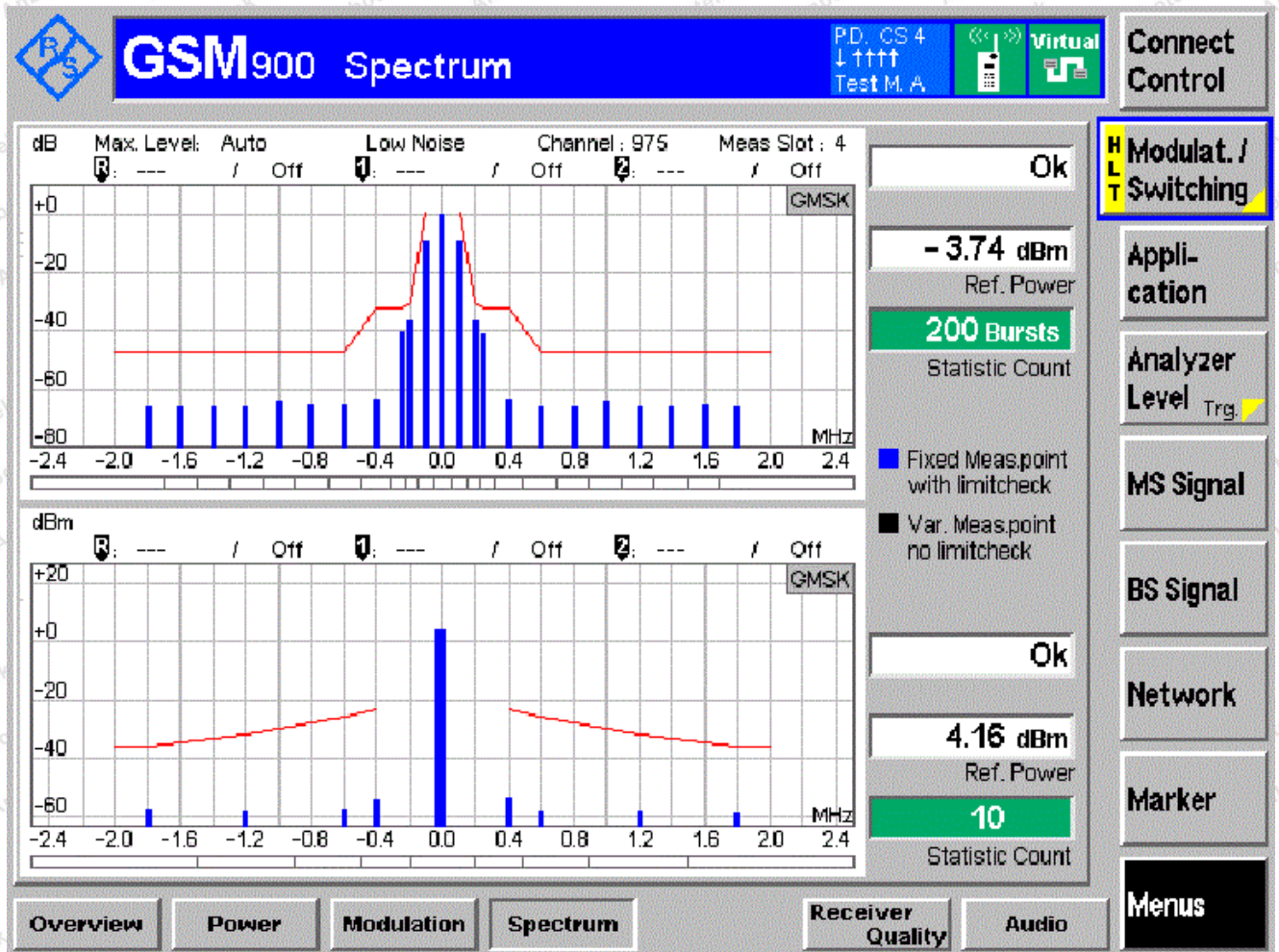
Channel MCH PCL 7



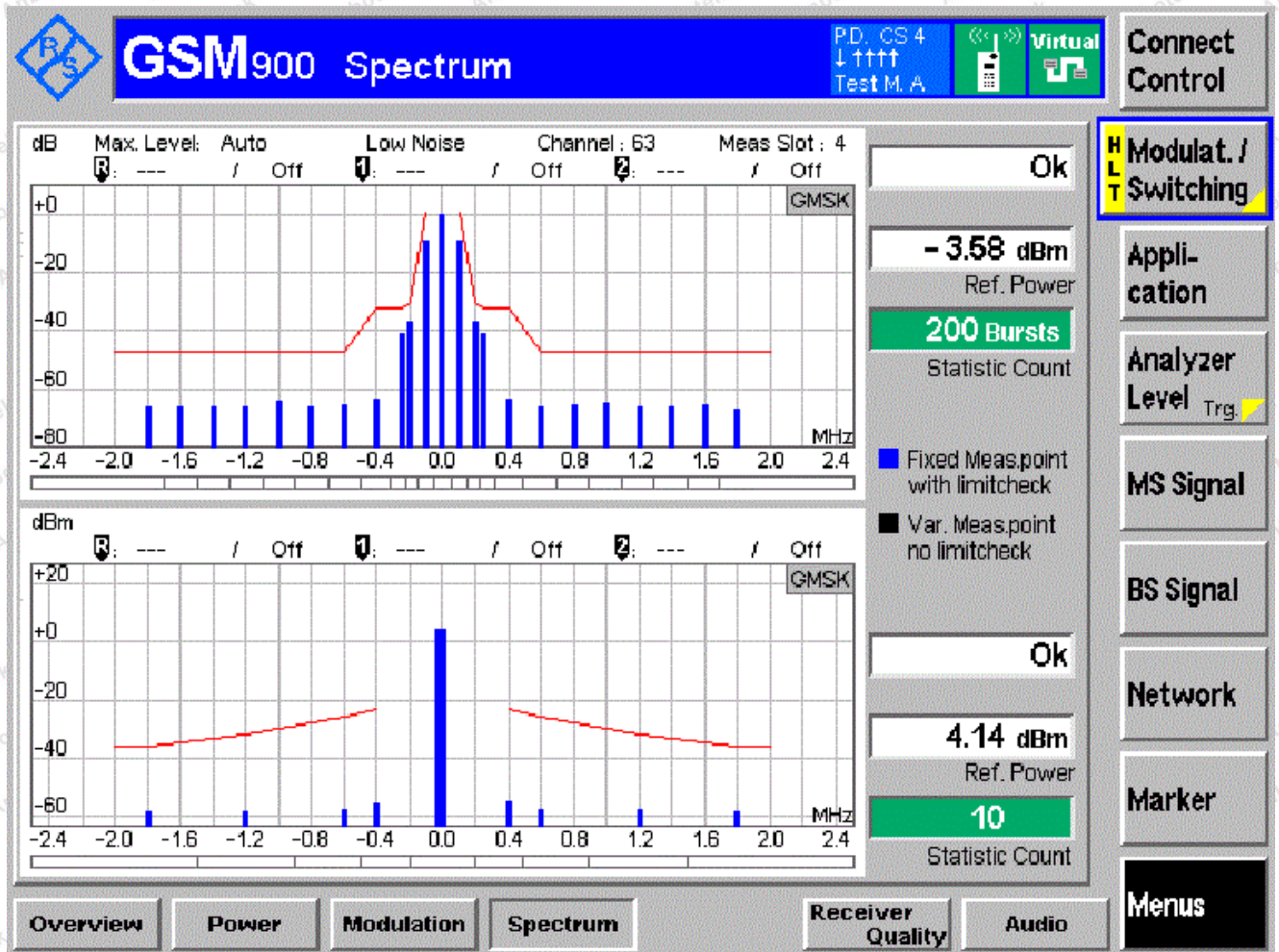
Channel HCH PCL 7



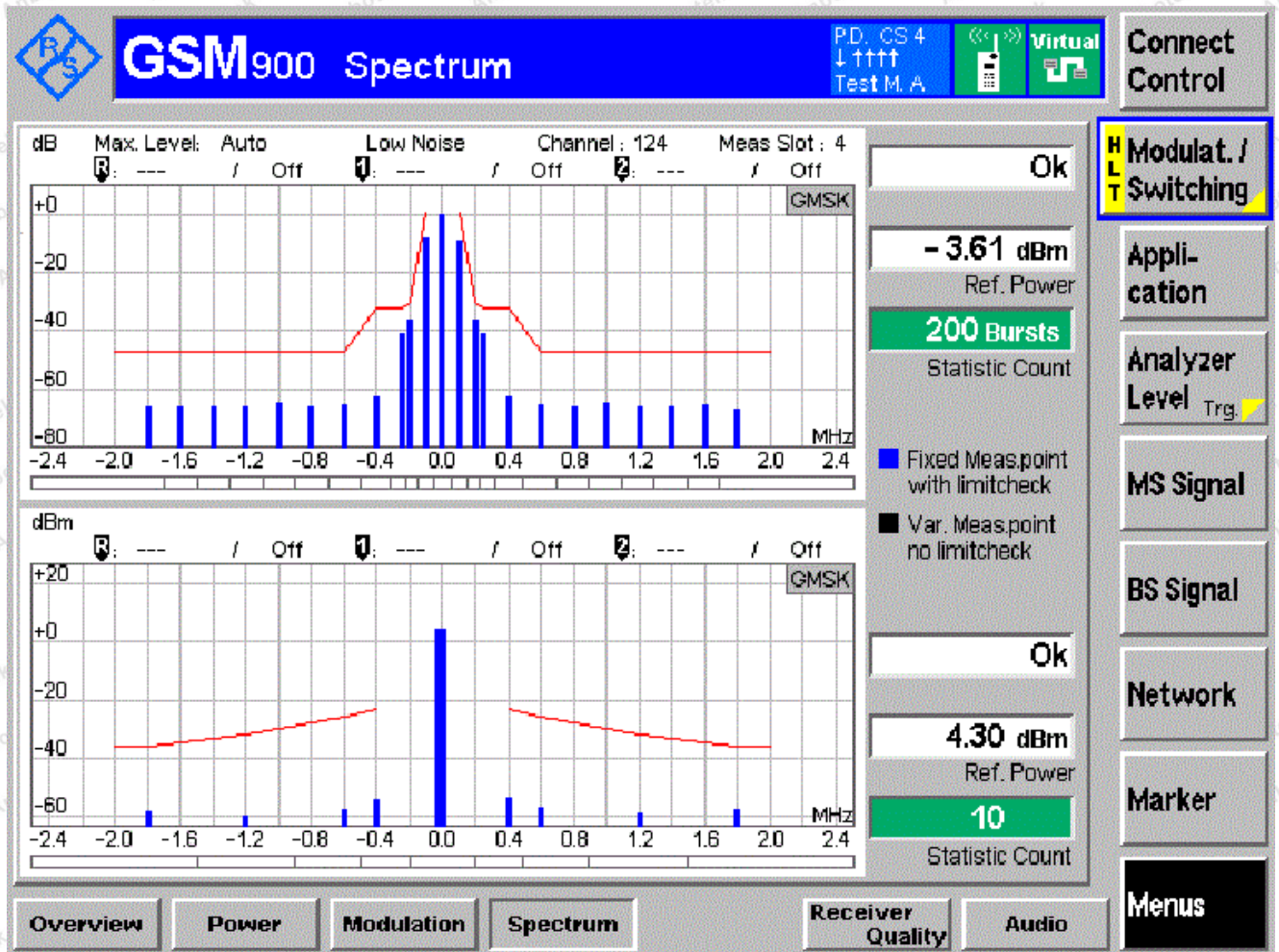
Channel LCH PCL 19



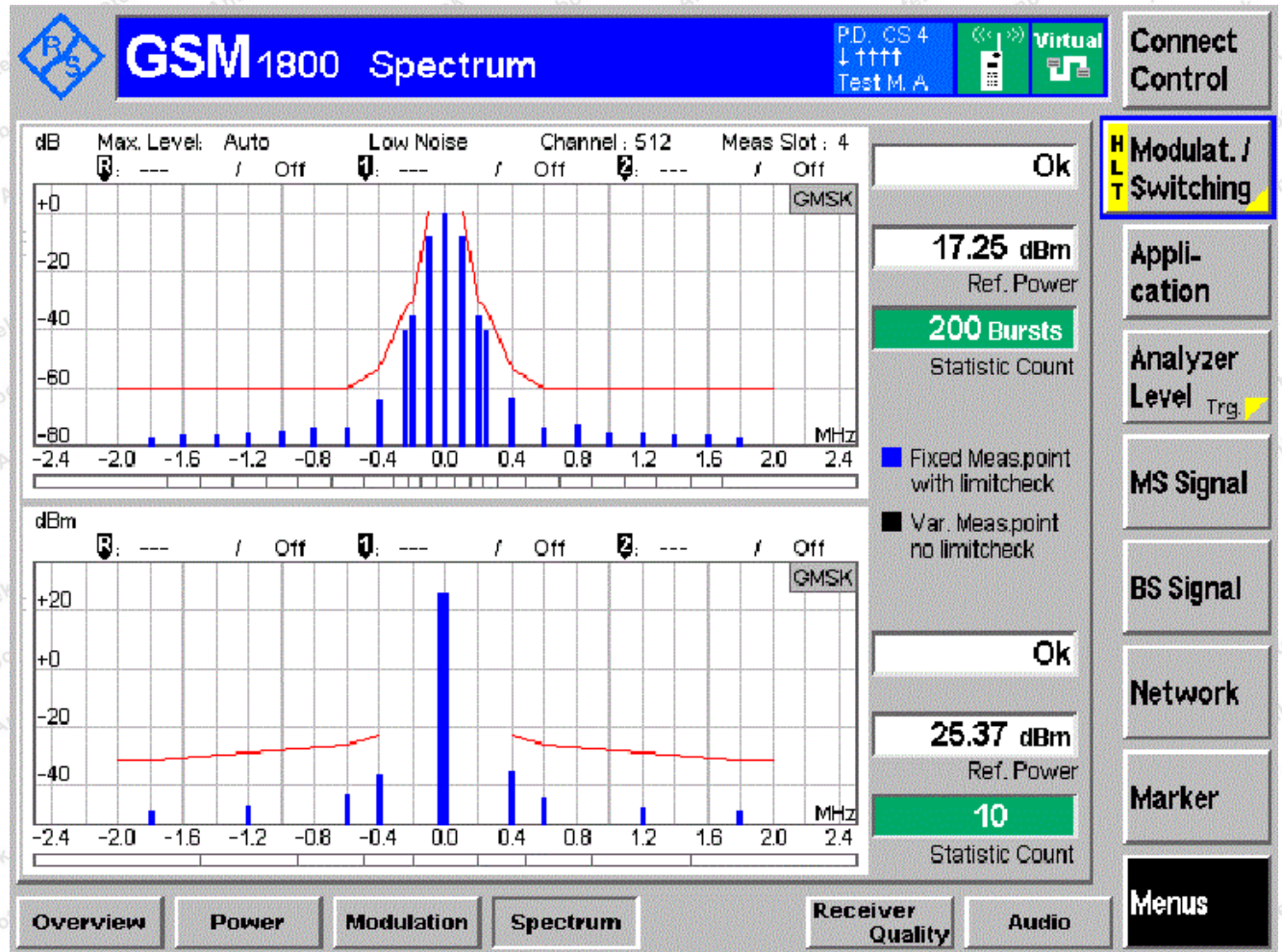
Channel MCH PCL 19



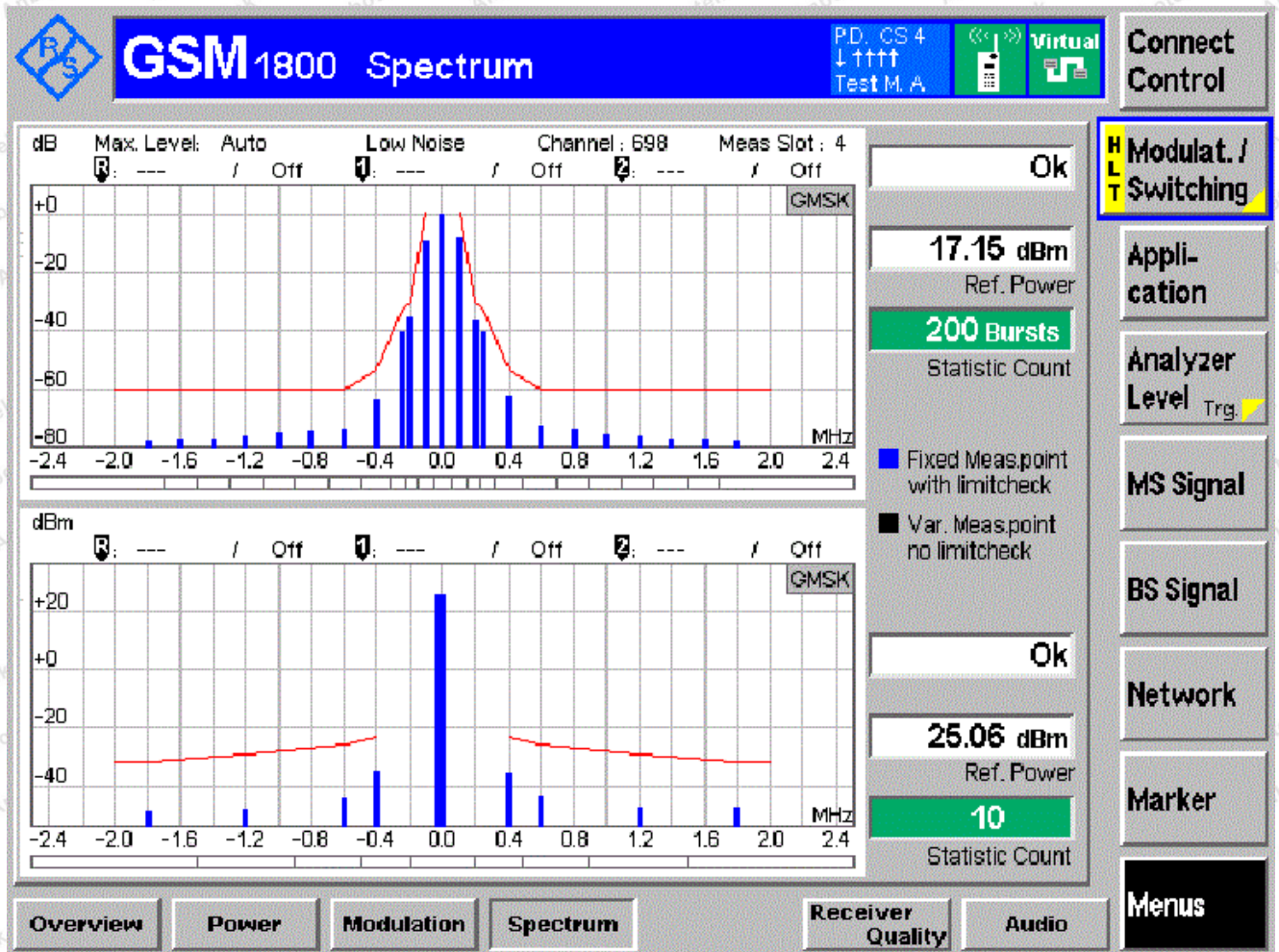
Channel HCH PCL 19



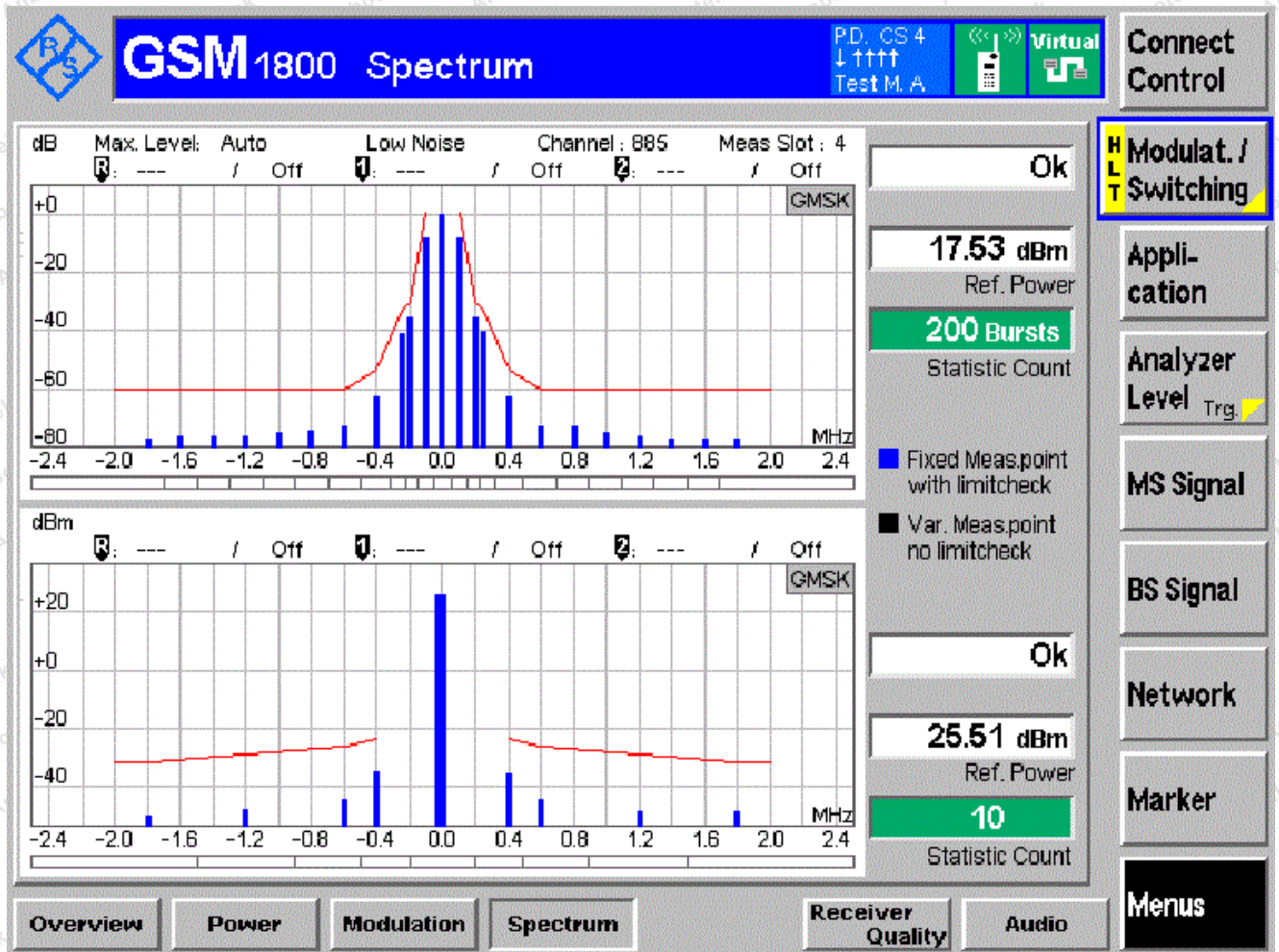
b) DCS1800 TN/VN
Channel LCH PCL 0

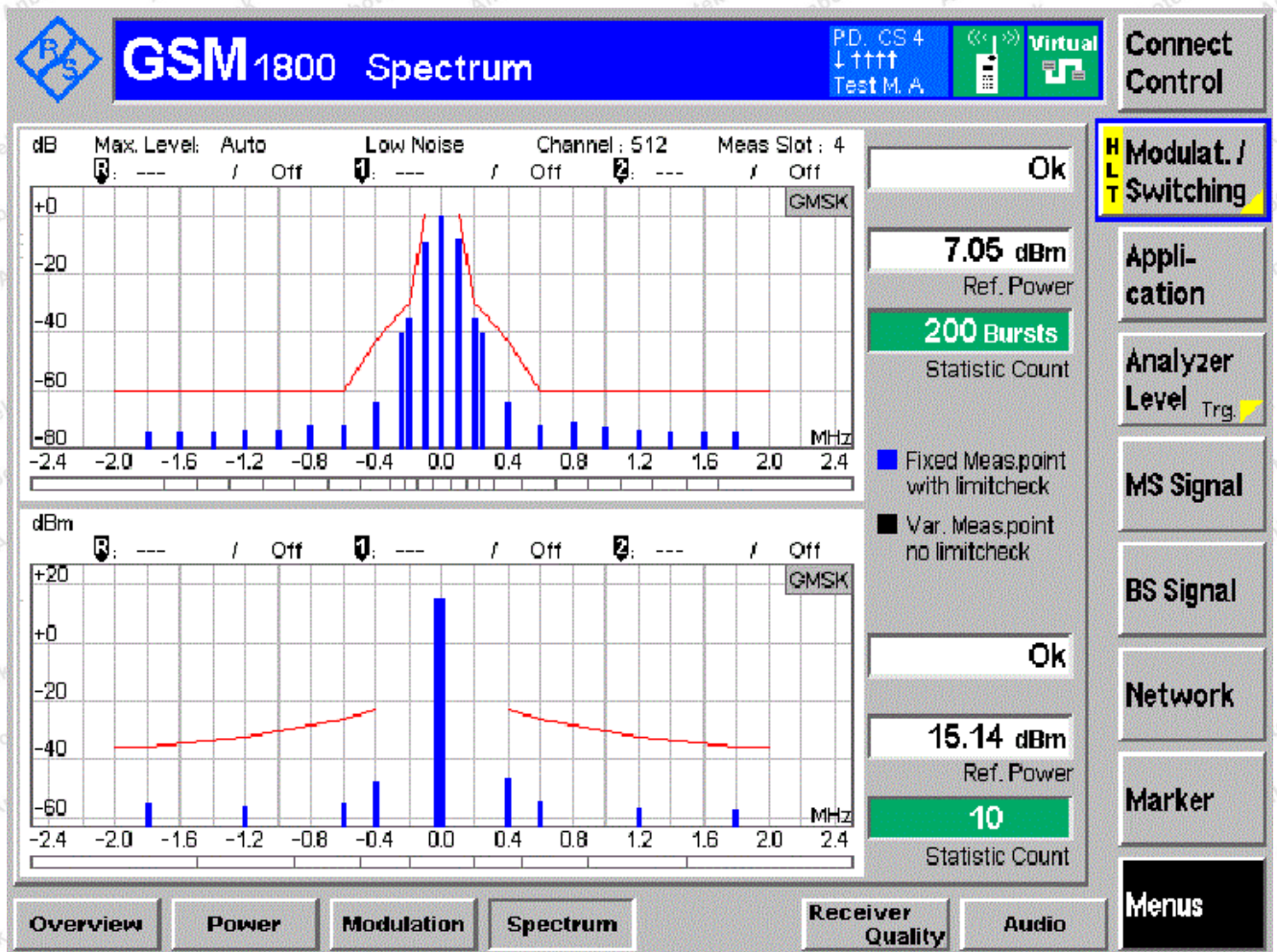


Channel MCH PCL 0

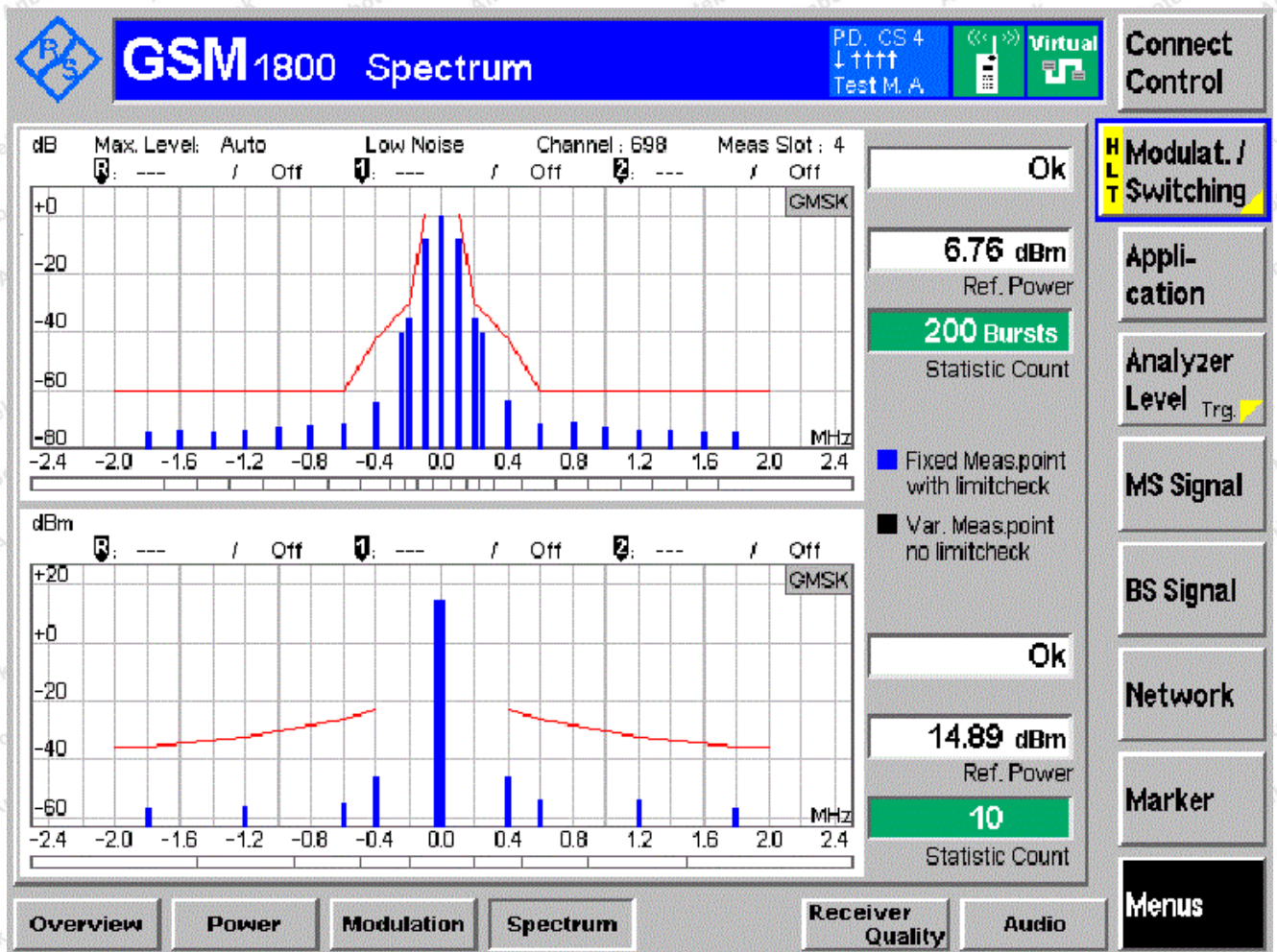


Channel HCH PCL 0

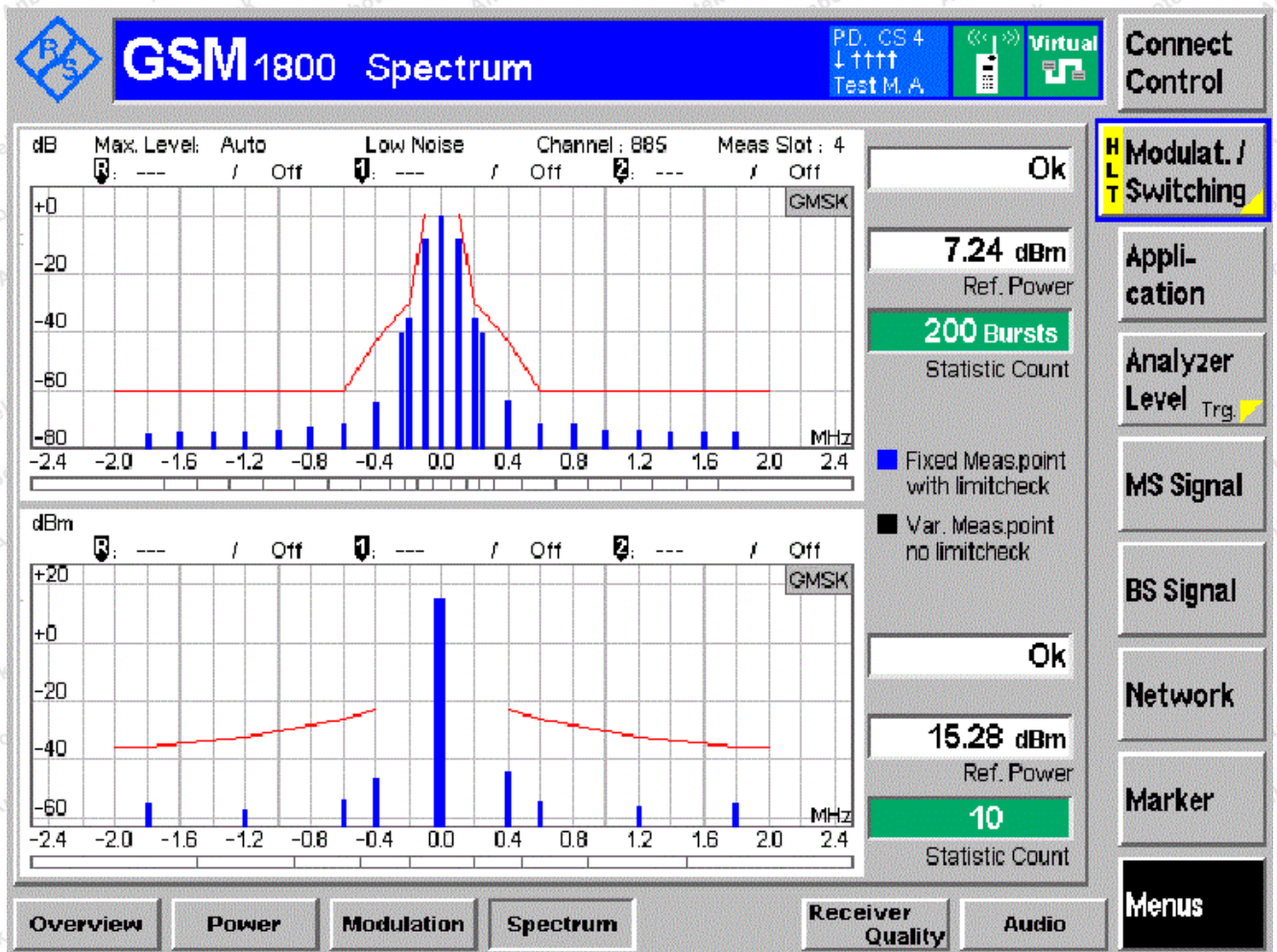




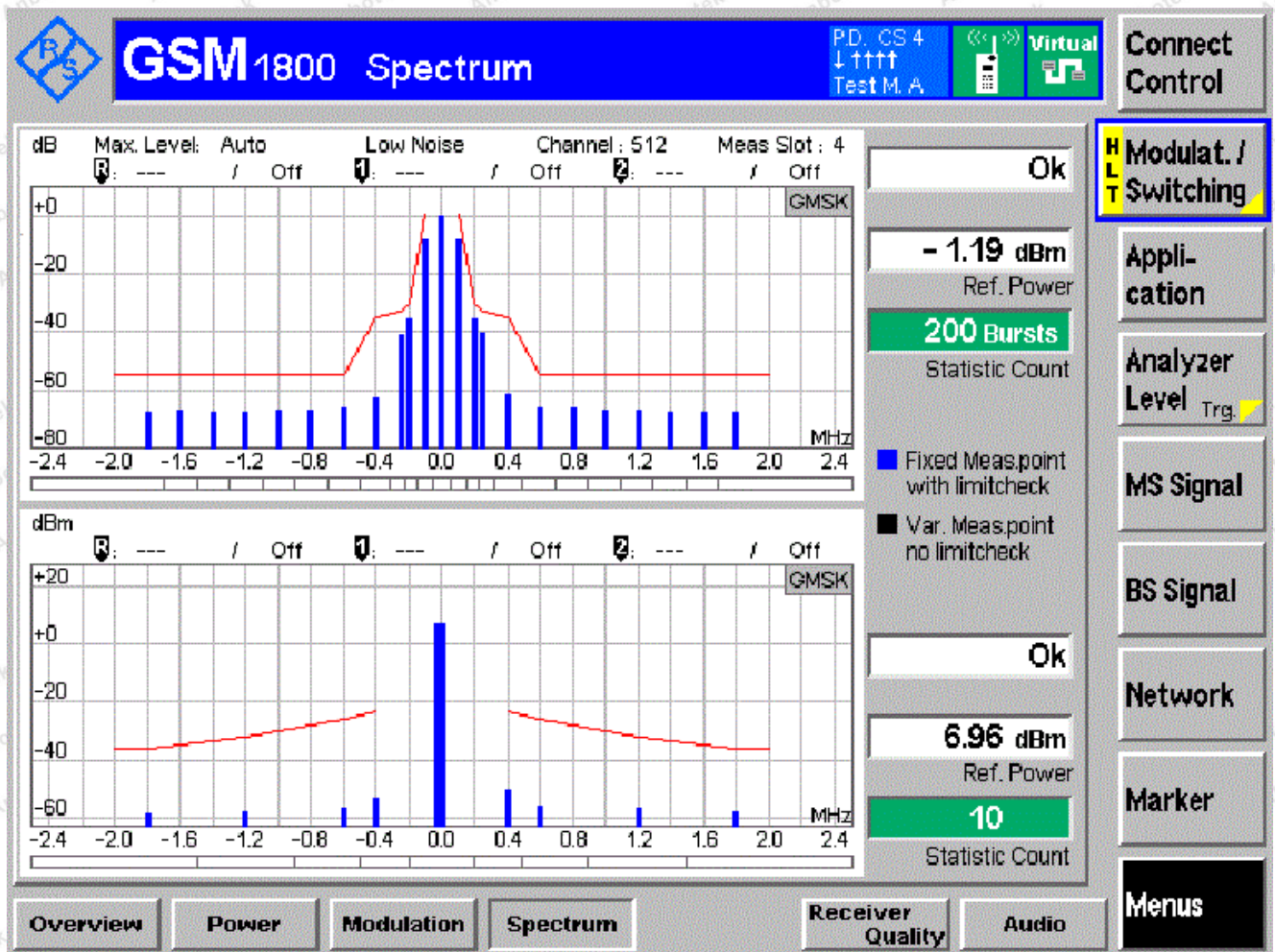
Channel MCH PCL 7



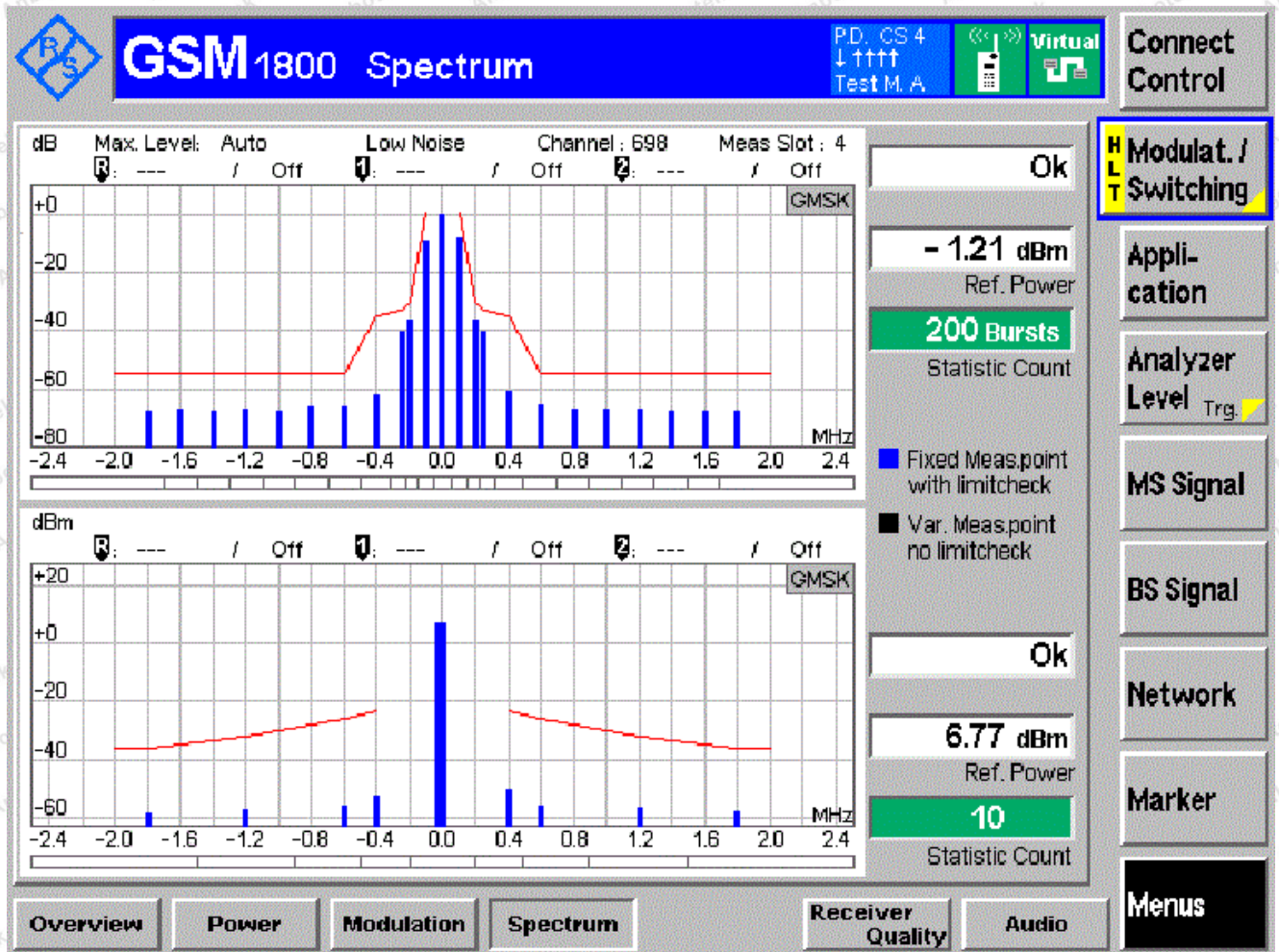
Channel HCH PCL 7



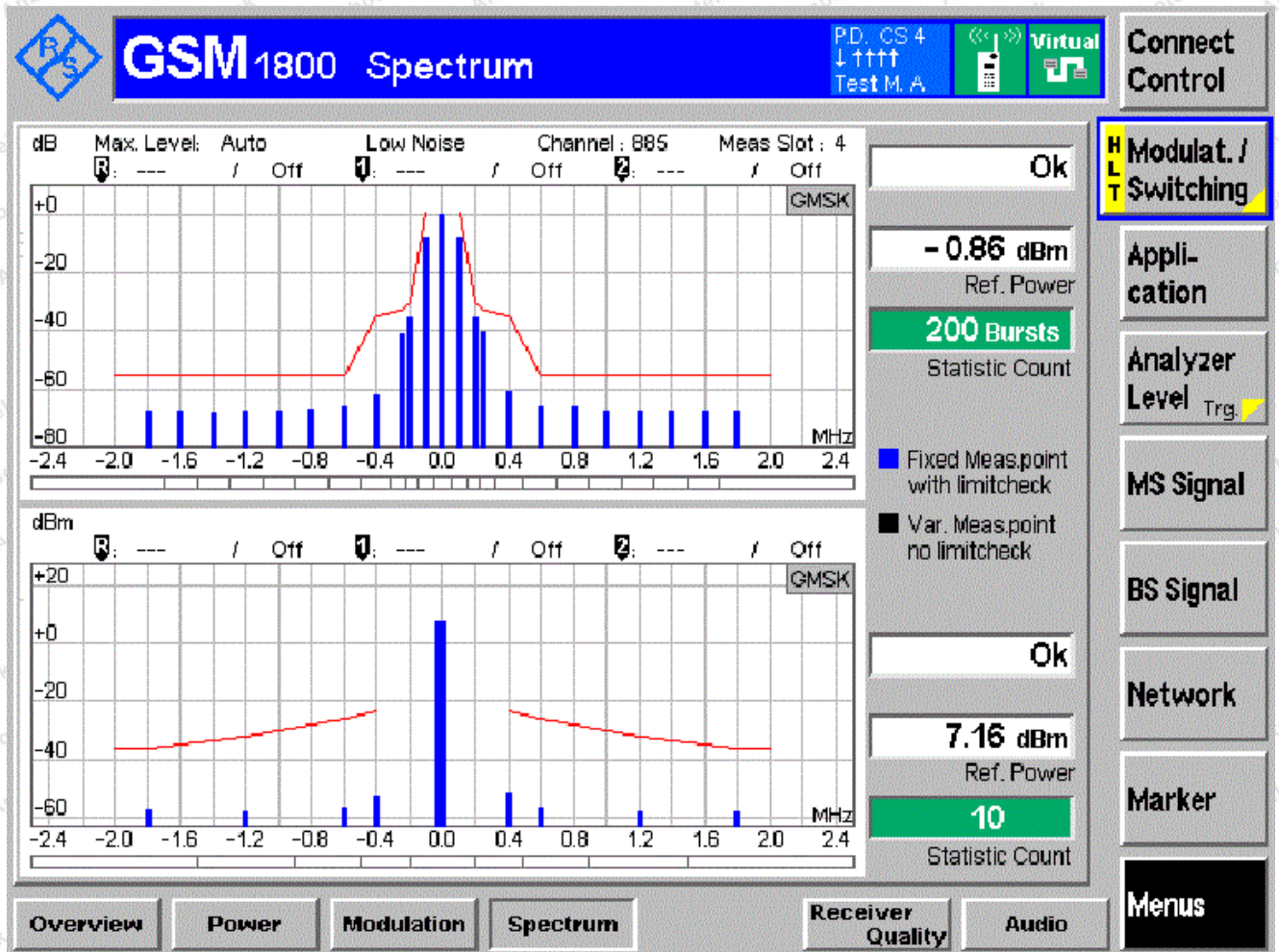
Channel LCH PCL 7

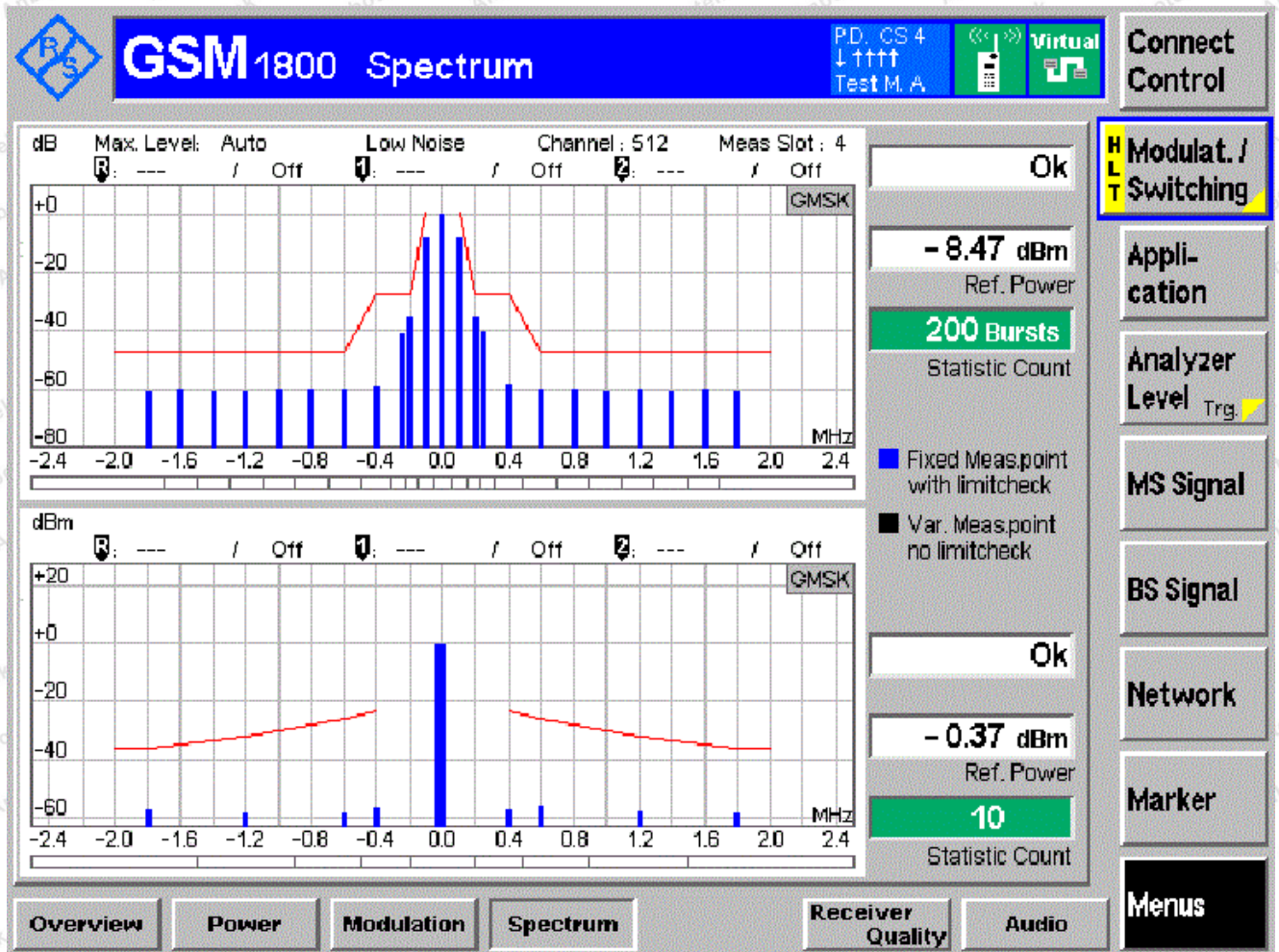


Channel MCH PCL 11

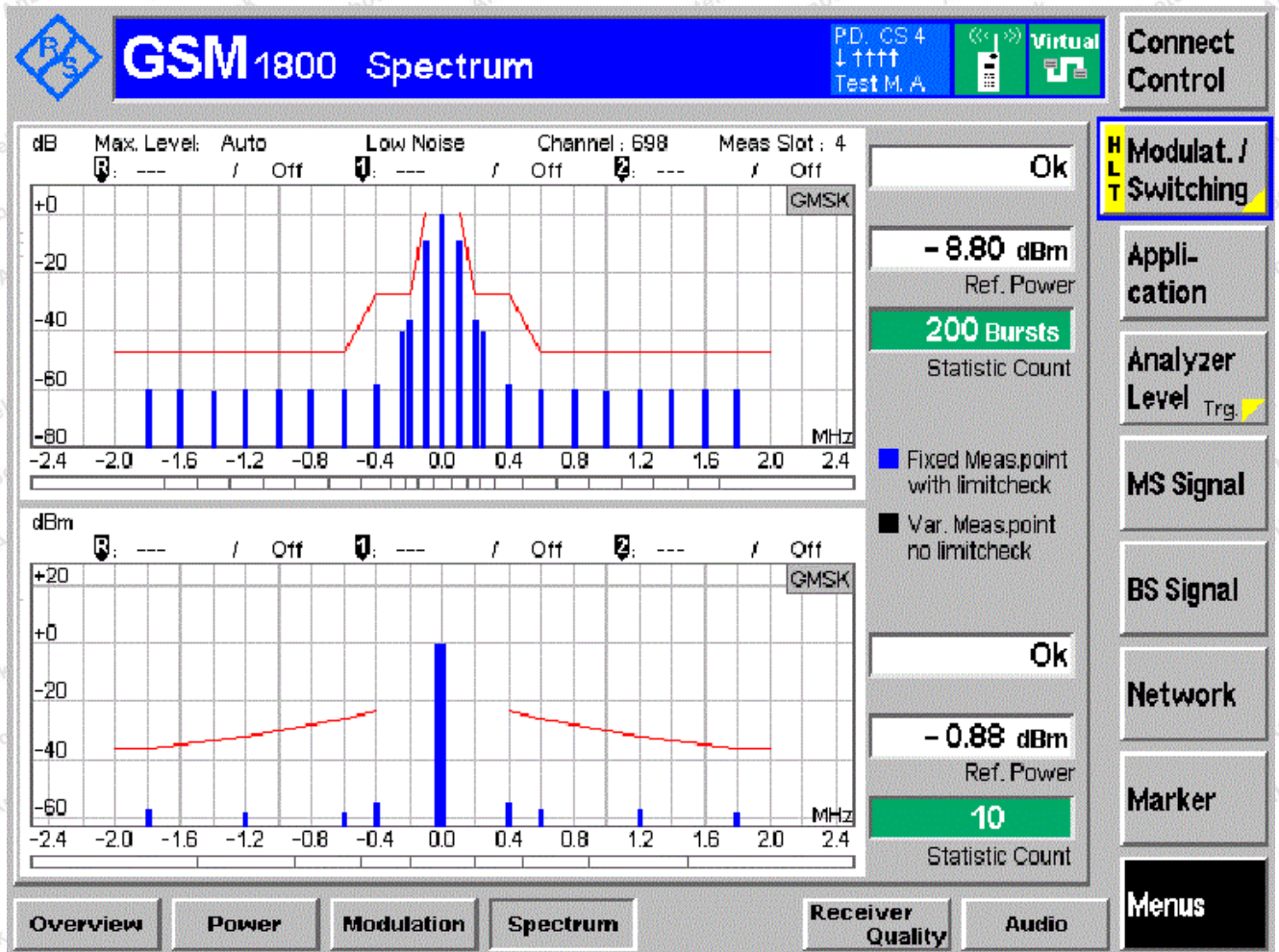


Channel HCH PCL 11

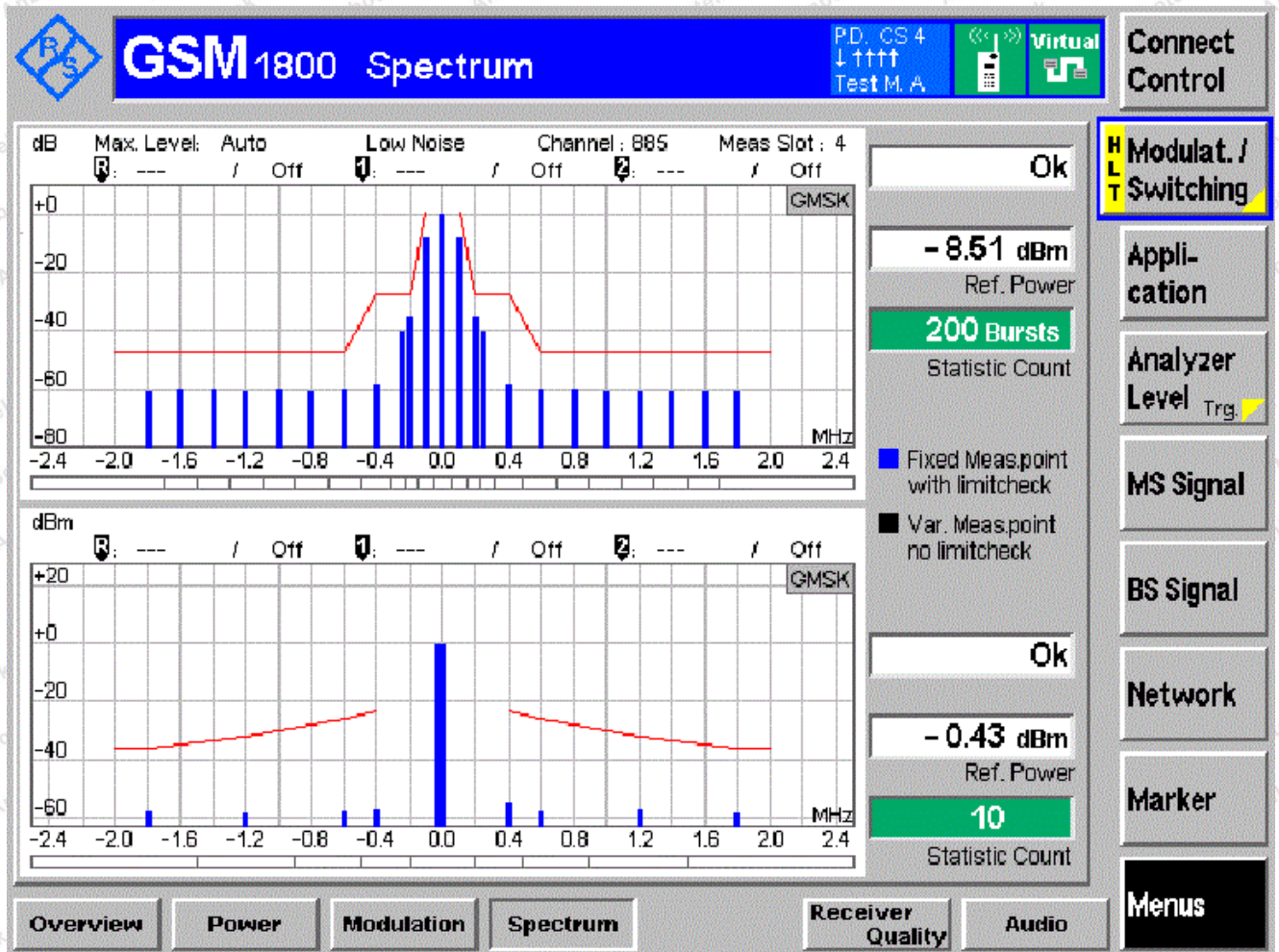




Channel MCH PCL 15



Channel HCH PCL 15



10. Conducted Spurious Emissions

10.1. Test Limit

The conducted spurious power emitted by the MS, when allocated a channel, shall be no more than the levels in below table under normal voltage and extrem voltage conditions:

| Frequency range | Power level in dBm | | |
|------------------------|--|-----------|-----------|
| | GSM 400, GSM 700, T-GSM 810 GSM 850, GSM 900 | DCS 1 800 | PCS 1 900 |
| 9 kHz to 1 GHz | -36 | -36 | -36 |
| 1 GHz to 12,75 GHz | -30 | | -30 |
| 1 GHz to 1 710 MHz | | -30 | |
| 1 710 MHz to 1 785 MHz | | -36 | |
| 1 785 MHz to 12,75 GHz | | -30 | |

MS in idle mode

| Frequency range | | Power level in dBm | |
|------------------------|--|--|-----------------------------------|
| | | GSM 400, T-GSM 810 GSM 900, DCS 1 800 | GSM 700, GSM 850, PCS 1 900 |
| 100 kHz to 880 MHz | | -57 | -57 |
| 880 MHz to 915 MHz | | -59 | -57 |
| 915 MHz to 1 000 MHz | | -57 | -57 |
| 1 GHz to 1 710 MHz | | -47 | |
| 1 710 MHz to 1 785 MHz | | -53 | |
| 1 785 MHz to 12,75 GHz | | -47 | |
| 1 GHz to 1 850 MHz | | | -47 |
| 1 850 MHz to 1 910 MHz | | | -53 |
| 1 910 MHz to 12,75 GHz | | | -47 |

10.2. Test Setup

Refer to clause 1.6

10.3. Test Procedure

1. Please refer to ETSI TS 151 010-1 V13.5.0 clause 12.1.1.3&12.1.2.3 for the test conditions.
2. Please refer to ETSI TS 151 010-1 V13.5.0 clause 12.1.1.4&12.1.2.4 for the measurement method.

10.4. Test Result

MS allocated a channel:

| Conducted spurious emissions | GSM900;MCH | | | | | |
|------------------------------|------------|---------|---------|---------|----------------|--------|
| Frequency range | RBW(Hz) | VL(dBm) | VN(dBm) | VH(dBm) | Max.Limit(dBm) | Result |
| 9kHz~100kHz | 1k | -45.80 | -45.71 | -45.42 | -36 | PASS |
| 100kHz~50MHz | 10k | -48.02 | -48.00 | -48.11 | -36 | PASS |
| 50MHz~500MHz | 100k | -43.34 | -43.89 | -44.17 | -36 | PASS |
| 500MHz~850MHz | 3M | -42.33 | -42.07 | -42.00 | -36 | PASS |
| 850MHz~863MHz | 1M | -47.20 | -47.17 | -47.10 | -36 | PASS |
| 863MHz~870MHz | 300k | -51.27 | -51.86 | -51.35 | -36 | PASS |
| 870MHz~880MHz | 100k | -56.68 | -57.30 | -57.30 | -36 | PASS |
| 915MHz~925MHz | 100k | -53.50 | -53.61 | -53.93 | -36 | PASS |
| 963MHz~1GHz | 3M | -42.38 | -42.53 | -42.88 | -36 | PASS |
| 1GHz~1805MHz | 3M | -30.88 | -30.57 | -30.61 | -30 | PASS |
| 1880MHz~12.75GHz | 3M | -31.76 | -31.55 | -31.66 | -30 | PASS |
| 896.6MHz~900.8MHz | 30K | -51.36 | -51.64 | -51.78 | -36 | PASS |
| 904.4MHz~908.6MHz | 30K | -48.11 | -48.74 | -49.04 | -36 | PASS |
| 880MHz~896.6MHz | 100K | -54.16 | -54.18 | -54.04 | -36 | PASS |
| 908.6MHz~915MHz | 100K | -52.24 | -52.28 | -52.50 | -36 | PASS |

| Conducted spurious emissions | DCS1800;MCH | | | | | |
|------------------------------|-------------|---------|---------|---------|----------------|--------|
| Frequency range | RBW(Hz) | VL(dBm) | VN(dBm) | VH(dBm) | Max.Limit(dBm) | Result |
| 9kHz~100kHz | 1k | -45.71 | -45.45 | -45.81 | -36 | PASS |
| 100kHz~50MHz | 10k | -48.07 | -48.30 | -47.81 | -36 | PASS |
| 50MHz~500MHz | 100k | -53.81 | -54.02 | -54.18 | -36 | PASS |
| 500MHz~925MHz | 3M | -39.32 | -39.90 | -39.76 | -36 | PASS |
| 963MHz~1GHz | 3M | -46.90 | -47.33 | -47.70 | -36 | PASS |
| 1GHz~1680MHz | 3M | -34.27 | -34.91 | -35.04 | -30 | PASS |
| 1680MHz~1690MHz | 1M | -46.26 | -46.02 | -46.18 | -30 | PASS |
| 1690MHz~1700MHz | 300k | -52.40 | -52.07 | -52.02 | -30 | PASS |
| 1700MHz~1710MHz | 100k | -56.90 | -56.63 | -56.64 | -30 | PASS |
| 1785MHz~1795MHz | 100K | -56.45 | -56.77 | -56.20 | -30 | PASS |
| 1795MHz~1805MHz | 300k | -51.03 | -50.99 | -51.22 | -30 | PASS |
| 1880MHz~12.75GHz | 3M | -34.40 | -34.68 | -34.93 | -30 | PASS |
| 1741.4MHz~1745.6GHz | 30K | -54.61 | -54.37 | -53.81 | -36 | PASS |
| 1749.2MHz~1753.4MHz | 30K | -53.06 | -52.88 | -53.10 | -36 | PASS |
| 1710MHz~1741.4MHz | 100K | -55.76 | -56.39 | -56.09 | -36 | PASS |
| 1753.4MHz~1785MHz | 100K | -55.54 | -55.75 | -55.46 | -36 | PASS |

MS in idle mode:

| Conducted spurious emissions | GSM900;VN | | | |
|------------------------------|-----------|----------------|----------|--------|
| Frequency range | RBW(Hz) | Max.Limit(dBm) | MCH(dBm) | Result |
| 9kHz~100kHz | 1k | -57 | -59.33 | PASS |
| 100kHz~50MHz | 10k | -57 | -60.04 | PASS |
| 50MHz~880MHz | 100k | -57 | -63.49 | PASS |
| 880MHz~915MHz | 100k | -59 | -63.48 | PASS |
| 915MHz~1000MHz | 100k | -57 | -61.37 | PASS |
| 1GHz~1710MHz | 100k | -47 | -55.40 | PASS |
| 1710MHz~1785MHz | 100k | -53 | -56.20 | PASS |
| 1785MHz~12.75GHz | 100k | -47 | -57.07 | PASS |

| Conducted spurious emissions | GSM900;VL | | | |
|------------------------------|-----------|----------------|----------|--------|
| Frequency range | RBW(Hz) | Max.Limit(dBm) | MCH(dBm) | Result |
| 9kHz~100kHz | 1k | -57 | -59.06 | PASS |
| 100kHz~50MHz | 10k | -57 | -59.39 | PASS |
| 50MHz~880MHz | 100k | -57 | -63.10 | PASS |
| 880MHz~915MHz | 100k | -59 | -63.56 | PASS |
| 915MHz~1000MHz | 100k | -57 | -61.29 | PASS |
| 1GHz~1710MHz | 100k | -47 | -55.24 | PASS |
| 1710MHz~1785MHz | 100k | -53 | -56.07 | PASS |
| 870MHz~880MHz | 100k | -36 | -57.21 | PASS |

| Conducted spurious emissions | GSM900;VH | | | |
|------------------------------|-----------|----------------|----------|--------|
| Frequency range | RBW(Hz) | Max.Limit(dBm) | MCH(dBm) | Result |
| 915MHz~925MHz | 100k | -36 | -59.27 | PASS |
| 963MHz~1GHz | 3M | -36 | -59.98 | PASS |
| 1GHz~1805MHz | 3M | -30 | -63.57 | PASS |
| 1880MHz~12.75GHz | 3M | -30 | -63.67 | PASS |
| 896.4MHz~900.6MHz | 30K | -36 | -61.59 | PASS |
| 904.2MHz~908.4MHz | 30K | -36 | -55.15 | PASS |
| 880MHz~896.4MHz | 100K | -36 | -56.42 | PASS |
| 908.4MHz~915MHz | 100K | -36 | -56.48 | PASS |

| Conducted spurious emissions | DCS1800;VN | | | |
|------------------------------|------------|----------------|----------|--------|
| Frequency range | RBW(Hz) | Max.Limit(dBm) | MCH(dBm) | Result |
| 9kHz~100kHz | 1k | -57 | -72.56 | PASS |
| 100kHz~50MHz | 10k | -57 | -58.33 | PASS |
| 50MHz~880MHz | 100k | -57 | -63.09 | PASS |
| 880MHz~915MHz | 100k | -59 | -63.13 | PASS |
| 915MHz~1000MHz | 100k | -57 | -57.40 | PASS |
| 1GHz~1710MHz | 100k | -47 | -66.16 | PASS |
| 1710MHz~1785MHz | 100k | -53 | -56.02 | PASS |
| 1785MHz~12.75GHz | 100k | -47 | -65.47 | PASS |

| Conducted spurious emissions | DCS1800;VL | | | |
|------------------------------|------------|----------------|----------|--------|
| Frequency range | RBW(Hz) | Max.Limit(dBm) | MCH(dBm) | Result |
| 9kHz~100kHz | 1k | -57 | -72.19 | PASS |
| 100kHz~50MHz | 10k | -57 | -58.13 | PASS |
| 50MHz~880MHz | 100k | -57 | -63.40 | PASS |
| 880MHz~915MHz | 100k | -59 | -63.31 | PASS |
| 915MHz~1000MHz | 100k | -57 | -57.85 | PASS |
| 1GHz~1710MHz | 100k | -47 | -66.00 | PASS |
| 1710MHz~1785MHz | 100k | -53 | -56.70 | PASS |
| 1785MHz~12.75GHz | 100k | -47 | -64.93 | PASS |

| Conducted spurious emissions | DCS1800;VH | | | |
|------------------------------|------------|----------------|----------|--------|
| Frequency range | RBW(Hz) | Max.Limit(dBm) | MCH(dBm) | Result |
| 9kHz~100kHz | 1k | -57 | -72.26 | PASS |
| 100kHz~50MHz | 10k | -57 | -57.85 | PASS |
| 50MHz~880MHz | 100k | -57 | -63.46 | PASS |
| 880MHz~915MHz | 100k | -59 | -63.50 | PASS |
| 915MHz~1000MHz | 100k | -57 | -57.61 | PASS |
| 1GHz~1710MHz | 100k | -47 | -66.26 | PASS |
| 1710MHz~1785MHz | 100k | -53 | -56.26 | PASS |
| 1785MHz~12.75GHz | 100k | -47 | -64.83 | PASS |

11. Radiated Spurious Emissions

11.1. Test Limit

The power of any spurious emission shall not exceed the levels given in below table

MS allocated a channel

| Frequency range | Power level in dBm | | |
|------------------------|--|-----------|-----------|
| | GSM 400, GSM 700, T-GSM 810 GSM 850, GSM 900 | DCS 1 800 | PCS 1 900 |
| 30 MHz to 1 GHz | -36 | -36 | -36 |
| 1 GHz to 4 GHz | -30 | | -30 |
| 1 GHz to 1 710 MHz | | -30 | |
| 1 710 MHz to 1 785 MHz | | -36 | |
| 1 785 MHz to 4GHz | | -30 | |

MS in idle mode

| Frequency range | | Power level in dBm | |
|------------------------|-----------|--|-----------------------------------|
| | | GSM 400, T-GSM 810 GSM 900, DCS 1 800 | GSM 700, GSM 850, PCS 1 900 |
| 30 MHz to 880 MHz | 880 MHz | -57 | -57 |
| 880 MHz to 915 MHz | 915 MHz | -59 | -57 |
| 915 MHz to 1 000 MHz | 1 000 MHz | -57 | -57 |
| 1 GHz to 1 710 MHz | 1 710 MHz | -47 | |
| 1 710 MHz to 1 785 MHz | 1 785 MHz | -53 | |
| 1 785 MHz to 4 GHz | 4 GHz | -47 | |
| 1 GHz to 1 850 MHz | 1 850 MHz | | -47 |
| 1 850 MHz to 1 910 MHz | 1 910 MHz | | -53 |
| 1 910 MHz to 4 GHz | 4 GHz | | -47 |

11.2. Test Setup

Refer to clause 3

11.3. Test Procedure

1. Please refer to ETSI TS 151 010-1 V13.5.0 clause 12.2.1.3&12.2.2.3 for the test conditions.
2. Please refer to ETSI TS 151 010-1 V13.5.0 clause 12.2.1.4&12.2.2.4 for the measurement method.
3. All supported bands(GSM900 and DCS1800) have been tested, only worst data listed.

11.4. Test Result

| Test Mode: GSM 900 Middle Channel CH63:902.6MHz Normal power supply | | | | |
|---|----------------------|--------------|-------------|-------------|
| Frequency (MHz) | Antenna polarization | Result (dBm) | Limit (dBm) | Margin (dB) |
| 258.9 | V | -51.27 | -36 | 15.27 |
| 459.6 | V | -63.21 | -36 | 27.21 |
| 715.9 | V | -56.96 | -36 | 20.96 |
| 1805.2 | V | -42.42 | -30 | 12.42 |
| 308.7 | H | -57.24 | -36 | 21.24 |
| 437.1 | H | -54.24 | -36 | 18.24 |
| 509.5 | H | -53.75 | -36 | 17.75 |
| 1805.2 | H | -42.76 | -30 | 12.76 |

| Test Mode: DCS 1800 Middle Channel CH698:1747.4MHz Normal power supply | | | | |
|--|----------------------|--------------|-------------|-------------|
| Frequency (MHz) | Antenna polarization | Result (dBm) | Limit (dBm) | Margin (dB) |
| 259.1 | V | -54.04 | -36 | 18.04 |
| 459.9 | V | -58.39 | -36 | 22.39 |
| 715.1 | V | -57.04 | -36 | 21.04 |
| 3494.8 | V | -43.24 | -30 | 13.24 |
| 309.2 | H | -59.30 | -36 | 23.3 |
| 436.9 | H | -63.41 | -36 | 27.41 |
| 509.2 | H | -58.69 | -36 | 22.69 |
| 3494.8 | H | -39.91 | -30 | 9.91 |

11.5. Test Results for MS in idle mode

| Test result (GSM900) | | | | |
|--|----------------------|--------------|-------------|-------------|
| Test Mode: Idle mode Normal power supply | | | | |
| Frequency (MHz) | Antenna polarization | Result (dBm) | Limit (dBm) | Margin (dB) |
| 259.2 | V | -73.45 | -57 | 16.45 |
| 459.9 | V | -72.04 | -57 | 15.04 |
| 715.1 | V | -76.13 | -57 | 19.13 |
| 308.6 | H | -76.92 | -57 | 19.92 |
| 437.2 | H | -76.53 | -57 | 19.53 |
| 509.3 | H | -74.06 | -57 | 17.06 |

12.Receiver Blocking and Spurious Response

12.1. Test Limit

The fixed testing of the conformance requirement is done using the minimum number of samples and the limit RBER given in table

| Channel | Type of measurement | Test limit error rate % | Minimum number of samples |
|-----------------|---------------------|-------------------------|---------------------------|
| TCH/FS Class II | RBER | 2,439 | 8 200 |

Statistical test limits for blocking performance of EGPRS mobiles

| Blocking and spurious response for EGPRS mobiles | | | | | | |
|--|--------------|------------------------|--------------------|--------------------------|----------------------|-----------------------------|
| | blocks per s | Orig. BLER requirement | Derived test limit | Target number of samples | Target test time (s) | Target test time (hh:mm:ss) |
| One time slot: | | | | | | |
| PDTCH/MCS-4 | 50 | 0,100000 | 0,125100 | 3221 | 64 | 00:01:04 |
| USF/MCS-4 | 50 | 0,010000 | 0,012510 | 32214 | 644 | 00:10:44 |
| PDTCH/MCS-9 | 50 | 0,100000 | 0,125100 | 3221 | 64 | 00:01:04 |
| USF/MCS-9 | 50 | 0,010000 | 0,012510 | 32214 | 644 | 00:10:44 |
| Two time slots: | | | | | | |
| PDTCH/MCS-4 | 100 | 0,100000 | 0,125100 | 3221 | 32 | 00:00:32 |
| USF/MCS-4 | 100 | 0,010000 | 0,012510 | 32214 | 322 | 00:05:22 |
| PDTCH/MCS-9 | 100 | 0,100000 | 0,125100 | 3221 | 32 | 00:00:32 |
| USF/MCS-9 | 100 | 0,010000 | 0,012510 | 32214 | 322 | 00:05:22 |
| Three time slots: | | | | | | |
| PDTCH/MCS-4 | 150 | 0,100000 | 0,125100 | 3221 | 21 | 00:00:21 |
| USF/MCS-4 | 150 | 0,010000 | 0,012510 | 32214 | 215 | 00:03:35 |
| PDTCH/MCS-9 | 150 | 0,100000 | 0,125100 | 3221 | 21 | 00:00:21 |
| USF/MCS-9 | 150 | 0,010000 | 0,012510 | 32214 | 215 | 00:03:35 |
| Four time slots: | | | | | | |

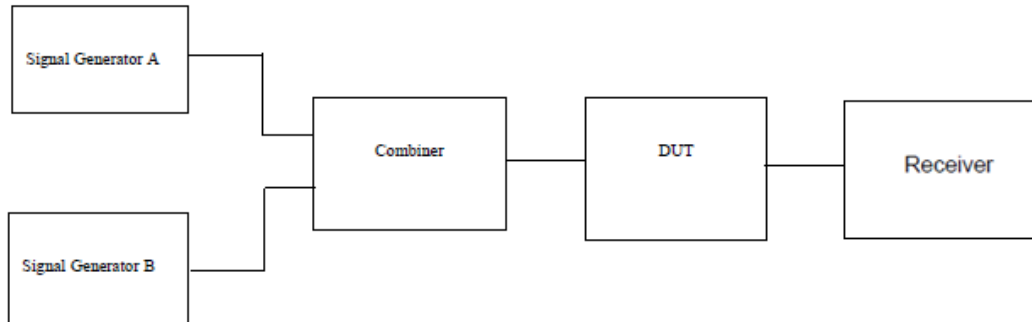
| slots | | | | | | |
|-------------|-----|----------|----------|-------|-----|----------|
| PDTCH/MCS-4 | 200 | 0,100000 | 0,125100 | 3221 | 16 | 00:00:16 |
| USF/MCS-4 | 200 | 0,010000 | 0,012510 | 32214 | 161 | 00:02:41 |
| PDTCH/MCS-9 | 200 | 0,100000 | 0,125100 | 3221 | 16 | 00:00:16 |
| USF/MCS-9 | 200 | 0,010000 | 0,012510 | 32214 | 161 | 00:02:41 |

Statistical test limits for blocking performance of EGPRS mobiles

| Blocking and spurious response for EGPRS mobiles | | | | | | |
|--|--------------|------------------------|--------------------|--------------------------|----------------------|-----------------------------|
| | blocks per s | Orig. BLER requirement | Derived test limit | Target number of samples | Target test time (s) | Target test time (hh:mm:ss) |
| One time slot: | | | | | | |
| PDTCH/MCS-4 | 50 | 0,100000 | 0,125100 | 3221 | 64 | 00:01:04 |
| USF/MCS-4 | 50 | 0,010000 | 0,012510 | 32214 | 644 | 00:10:44 |
| PDTCH/MCS-9 | 50 | 0,100000 | 0,125100 | 3221 | 64 | 00:01:04 |
| USF/MCS-9 | 50 | 0,010000 | 0,012510 | 32214 | 644 | 00:10:44 |
| Two time slots: | | | | | | |
| PDTCH/MCS-4 | 100 | 0,100000 | 0,125100 | 3221 | 32 | 00:00:32 |
| USF/MCS-4 | 100 | 0,010000 | 0,012510 | 32214 | 322 | 00:05:22 |
| PDTCH/MCS-9 | 100 | 0,100000 | 0,125100 | 3221 | 32 | 00:00:32 |
| USF/MCS-9 | 100 | 0,010000 | 0,012510 | 32214 | 322 | 00:05:22 |
| Three time slots | | | | | | |
| PDTCH/MCS-4 | 150 | 0,100000 | 0,125100 | 3221 | 21 | 00:00:21 |
| USF/MCS-4 | 150 | 0,010000 | 0,012510 | 32214 | 215 | 00:03:35 |
| PDTCH/MCS-9 | 150 | 0,100000 | 0,125100 | 3221 | 21 | 00:00:21 |
| USF/MCS-9 | 150 | 0,010000 | 0,012510 | 32214 | 215 | 00:03:35 |
| Four time slots | | | | | | |
| PDTCH/MCS-4 | 200 | 0,100000 | 0,125100 | 3221 | 16 | 00:00:16 |
| USF/MCS-4 | 200 | 0,010000 | 0,012510 | 32214 | 161 | 00:02:41 |

| | | | | | | |
|-------------|-----|----------|----------|-------|-----|----------|
| PDTCH/MCS-9 | 200 | 0,100000 | 0,125100 | 3221 | 16 | 00:00:16 |
| USF/MCS-9 | 200 | 0,010000 | 0,012510 | 32214 | 161 | 00:02:41 |

12.2. Test Setup



12.3. Test Procedure

1. Please refer to ETSI TS 151 010-1 V13.5.0 clause 14.7.1.5&14.18.5.5 for the test conditions.
2. Please refer to ETSI TS 151 010-1 V13.5.0 clause 14.7.1.4&14.18.5.4 for the measurement method.

12.4. Test Result

GSM900

| Channel(MHz) | Test condition | number of samples | RBBER(%) | Limit(%) | Result |
|--------------|----------------|-------------------|----------|----------|--------|
| 880.2 | normal | 10000 | 0.835 | 2.439 | PASS |
| 902.6 | | 10000 | 0.168 | | |
| 914.8 | | 10000 | 0.426 | | |

GPRS900

| Channel(MHz) | Test condition | number of samples | RBBER(%) | Limit(%) | Result |
|--------------|----------------|-------------------|----------|----------|--------|
| 880.2 | normal | 10000 | 1.285 | 2.439 | PASS |
| 902.6 | | 10000 | 1.352 | | |
| 914.8 | | 10000 | 1.099 | | |

GSM1800

| Channel(MHz) | Test condition | number of samples | RBBER(%) | Limit(%) | Result |
|--------------|----------------|-------------------|----------|----------|--------|
| 1710.2 | normal | 10000 | 0.297 | 2.439 | PASS |
| 1747.4 | | 10000 | 1.078 | | |
| 1784.8 | | 10000 | 1.348 | | |

GPRS1800

| Channel(MHz) | Test condition | number of samples | RBBER(%) | Limit(%) | Result |
|--------------|----------------|-------------------|----------|----------|--------|
| 1710.2 | normal | 10000 | 0.182 | 2.439 | PASS |
| 1747.4 | | 10000 | 0.819 | | |
| 1784.8 | | 10000 | 0.563 | | |

13.Receiver Blocking and Spurious Response - Speech Channels

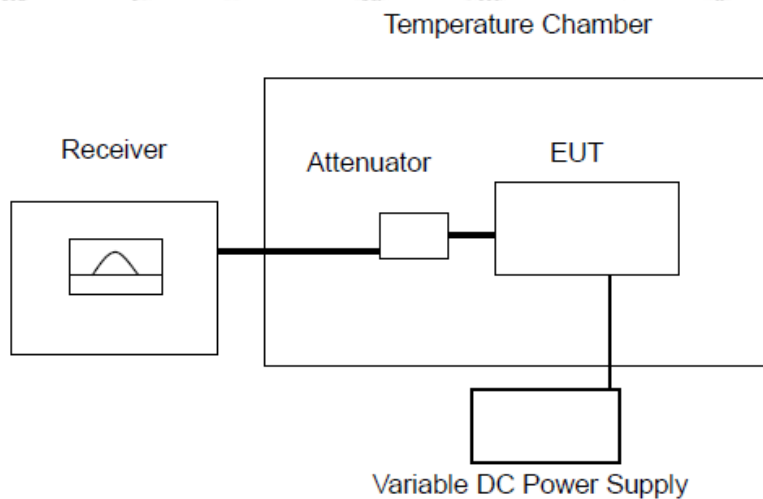
13.1. Test Limit

The frequency error, with reference to the SS carrier frequency as measured in repeats of step e), for each measured burst shall be less than the values shown in table

Requirements for frequency error under multipath, Doppler shift and interference conditions

| GSM 400 | | T-GSM 810, GSM 850 and GSM 900 | | DCS 1 800 and PCS 1 900 | |
|------------------------|---------------------------|--------------------------------|---------------------------|-------------------------|---------------------------|
| Propagat ion condition | Permitted frequency error | Propagatio n condition | Permitted frequency error | Propagati on condition | Permitted frequency error |
| RA500 | ±300 Hz | RA250 | ±300 Hz | RA130 | ±400 Hz |
| HT200 | ±180 Hz | HT100 | ±180 Hz | HT100 | ±350 Hz |
| TU100 | ±163 Hz | TU50 | ±163 Hz | TU50 | ±263 Hz |
| TU6 | ±230 Hz | TU3 | ±230 Hz | TU1,5 | ±320 Hz |

13.2. Test Setup



13.3. Test Procedure

1. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.17.2.3 for the test conditions.
2. Please refer to ETSI TS 151 010-1 V13.5.0 clause 13.17.2.4 for the measurement method..

13.4. Test Result

| FREQUENCY | Measurement Result | |
|----------------------------------|---------------------------------|--------|
| | GSM900 | |
| | Small MS | |
| | Interference Level in dBμVemf() | Result |
| FR +/- 630 kHz to FR +/- 800 kHz | 75 | Pass |
| FR +/- 800 kHz to FR +/- 1,6 MHz | 75 | Pass |
| FR +/- 1,6 MHz to FR +/- 3 MHz | 92 | Pass |
| 915 MHz to FR - 3 MHz | 89 | Pass |
| FR + 3 MHz to 980 MHz | 98 | Pass |
| 835 MHz to <915 MHz | 115 | Pass |
| >980 MHz to 1000 MHz | 117 | Pass |
| 100 kHz to <835 MHz | 93 | Pass |
| >1000 MHz to 12,75 GHz | 94 | Pass |

| FREQUENCY | Measurement Result | |
|----------------------------------|---------------------------------|--------|
| | DCS1800 | |
| | Small MS | |
| | Interference Level in dBμVemf() | Result |
| FR +/- 630 kHz to FR +/- 800 kHz | 72 | Pass |
| FR +/- 800 kHz to FR +/- 1,6 MHz | 72 | Pass |
| FR +/- 1,6 MHz to FR +/- 3 MHz | 80 | Pass |
| 1785 MHz to FR - 3 MHz | 89 | Pass |
| FR + 3 MHz to 1920 MHz | 89 | Pass |
| 100 kHz to 1705 MHz | 113 | Pass |
| >1705 MHz to <1785 MHz | 105 | Pass |
| >1920 MHz to 1980 MHz | 104 | Pass |
| >1980 MHz to 12,75 GHz | 92 | Pass |

14. Am suppression - Speech Channels

14.1. Test Limit

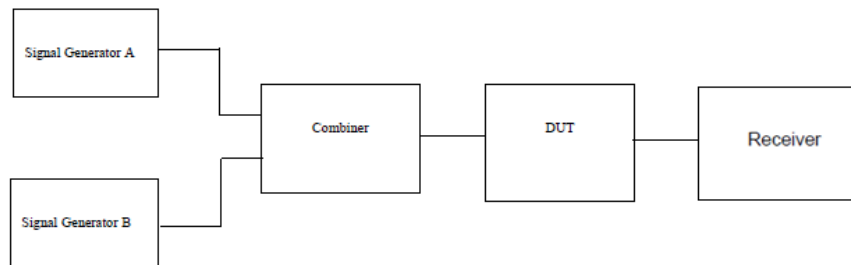
The error rates measured in this test shall not exceed the test limit error rate values given in table

| Channel | Type of measurement | Test limit error rate % | Minimum number of samples |
|-----------------|---------------------|-------------------------|---------------------------|
| TCH/FS Class II | RBER | 2,439 | 8 200 |

14.2. Test Procedures

1. Please refer to ETSI TS 151 010-1 V13.5.0 clause 14.8.1.4 for the measurement method.

14.3. Test Setup



14.4. Test Results

GSM900

| Channel(MHz) | Test condition | number of samples | RBER(%) | Limit(%) | Result |
|--------------|----------------|-------------------|---------|----------|--------|
| 880.2 | normal | 10000 | 1.043 | 2.439 | PASS |
| 902.6 | | 10000 | 1.113 | | |
| 914.8 | | 10000 | 0.635 | | |

DCS1800

| Channel(MHz) | Test condition | number of samples | RBER(%) | Limit(%) | Result |
|--------------|----------------|-------------------|---------|----------|--------|
| 1710.2 | normal | 10000 | 1.500 | 2.439 | PASS |
| 1747.4 | | 10000 | 0.239 | | |
| 1784.8 | | 10000 | 0.398 | | |

15. Intermodulation Rejection

15.1. Test Limit

Limits for Intermodulation rejection - speech channels

| Channel | Propagation conditions | Type of measurement | Test limit error rate % | Minimum number of samples |
|-----------------|------------------------|---------------------|-------------------------|---------------------------|
| TCH/FS Class II | Static | RBER | 2,439 | 8 200 |

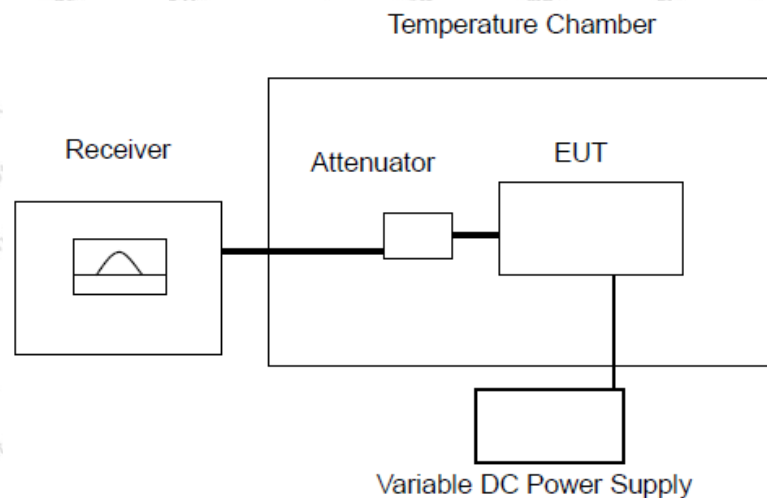
Limits for Intermodulation rejection - control channels

| Channel | Propagation conditions | Type of measurement | GSM 400, GSM 700, T-GSM 810, GSM 850 and GSM 900 | | DCS 1 800 and PCS 1 900 | |
|---------|------------------------|---------------------|--|----------------------------|-------------------------|------------------------|
| | | | Test limit error rate % | Minimum No. of max-samples | Test limit error rate % | Min No. of max-samples |
| FACCH/F | TUhigh/No FH | FER | 8,961 | 6 696 | 4,368 | 13 736 |

15.2. Test Procedures

- Please refer to ETSI TS 151 010-1 V13.5.0 clause 14.6.1.4.2& clause 14.6.2.4.2 for the measurement method.

15.3. Test Setup



15.4. Test Results

| intermodulation rejection- speech channels (GSM900) | | | | |
|--|------------|----------------|---------|----------|
| Channel(MHz) | conditions | No. of samples | RBER(%) | Limit(%) |
| 902.6 | Static | 10000 | 0.929 | 2.439 |
| intermodulation rejection- speech channels (DCS1800) | | | | |
| Channel(MHz) | conditions | No. of samples | RBER(%) | Limit(%) |
| 1747.4 | Static | 10000 | 0.667 | 2.439 |

| intermodulation rejection- control channels (GSM900) | | | | |
|---|--------------|----------------|--------|----------|
| Channel(MHz) | conditions | No. of samples | FER(%) | Limit(%) |
| 902.6 | TUhigh/No FH | 10000 | 0.495 | 8.961 |
| intermodulation rejection- control channels (DCS1800) | | | | |
| Channel(MHz) | conditions | No. of samples | FER(%) | Limit(%) |
| 1747.4 | TUhigh/No FH | 10000 | 1.091 | 4.368 |

16. Adjacent Channel Rejection

16.1. Test Limit

Limits for adjacent channel selectivity-speech channels

| | | | SM 400, GSM 700, T-GSM, 810, GSM 850 and GSM 900 | | DCS 1 800 and PCS 1 900 | |
|---------------------------|----------|---------------------|---|------------------------|-------------------------|------------------------|
| Interference at | Channel | Type of measurement | Test limit error rate% | Minimum No. of samples | Test limit error rate% | Minimum No. of samples |
| 200 kHz | TCH/FS | FER | 6,742* α | 8 900 | 3,371* α | 17 800 |
| | class Ib | RBER | 0,420/ α | 1 000 000 | 0,270/ α | 2 000 000 |
| | class II | RBER | 8,333 | 630 000 | 8,333 | 1 200 000 |
| 400 kHz Interferer TUhigh | TCH/FS | FER | 6,742* α | 8 900 | 3,371* α | 17 800 |
| | class Ib | RBER | 0,420/ α | 1 000 000 | 0,270/ α | 2 000 000 |
| | class II | RBER | 8,333 | 630 000 | 8,333 | 1 200 000 |
| 400 kHz Interferer Static | TCH/FS | FER | 11,461* α | 8 900 | 5,714* α | 10 500 |
| | class Ib | RBER | 0,756/ α | 1 000 000 | 0,483/ α | 1 200 000 |
| | class II | RBER | 9,167 | 630 000 | 9,167 | 720 000 |

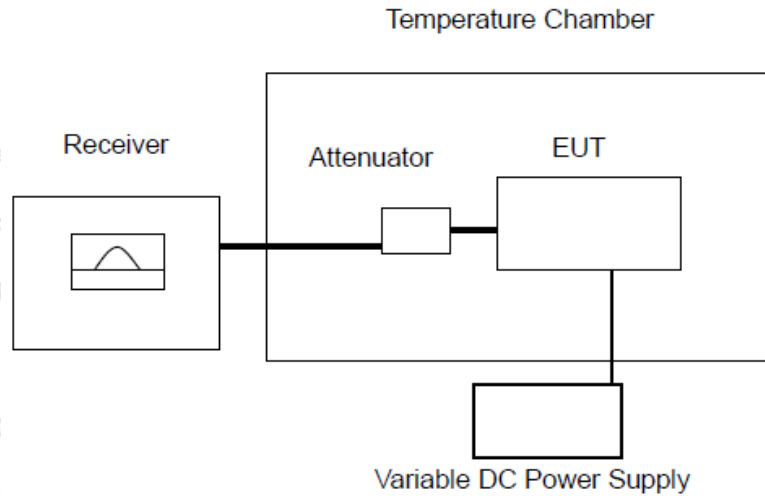
Limits for adjacent channel selectivity- control channels

| Interference at | Channel | Type of measurement | Test limit error rate % | Minimum No. of samples | Test limit error rate % | Minimum No. of samples |
|----------------------------------|------------------------|---------------------|-------------------------|------------------------|-------------------------|------------------------|
| 200 kHz/400 kHz interferer faded | Propagation conditions | FER | 10,640 | 5 639 | 3,808 | 15 756 |
| 400 kHz interferer static | FACCH/F | FER | 19,152 | 3 133 | 6,832 | 8 782 |

16.2. Test Procedures

1. Please refer to ETSI TS 151 010-1 clause 14.5.1.4&14.5.2.4 for the measurement method.

16.3. Test Setup



16.4. Test Results

| Reference sensitivity - TCH/FS(GSM900) | | | | |
|--|---------------------------------|---------------|----------------|--------|
| Test style | Test condition | Channel (MHz) | No. of samples | Result |
| FER | 200KHz | 902.6 | 8900 | Pass |
| | 400 kHz Interferer TUhigh | | 8900 | Pass |
| | 400 kHz Interferer Static | | 8900 | Pass |
| class Ib(RBER) | 200KHz | 902.6 | 1000000 | Pass |
| | 400 kHz Interferer TUhigh | | 1000000 | Pass |
| | 400 kHz Interferer Static | | 1000000 | Pass |
| class II(RBER) | 200KHz | 902.6 | 630000 | Pass |
| | 400 kHz Interferer TUhigh | | 630000 | Pass |
| | 400 kHz Interferer Static | | 630000 | Pass |

$\alpha = 1$

| Reference sensitivity - TCH/FS(DCS1800) | | | | |
|---|---------------------------------|---------------|----------------|--------|
| Test style | Test condition | Channel (MHz) | No. of samples | Result |
| FER | 200KHz | 1747.4 | 17800 | Pass |
| | 400 kHz Interferer TUhigh | | 17800 | Pass |
| | 400 kHz Interferer Static | | 17800 | Pass |
| | | | | |
| class Ib(RBER) | 200KHz | 1747.4 | 2000000 | Pass |
| | 400 kHz Interferer TUhigh | | 2000000 | Pass |
| | 400 kHz Interferer Static | | 2000000 | Pass |
| class II(RBER) | 200KHz | 1747.4 | 120000 | Pass |
| | 400 kHz Interferer TUhigh | | 120000 | Pass |
| | 400 kHz Interferer Static | | 120000 | Pass |
| $\alpha=1$ | | | | |

17. Reference Sensitivity

17.1. Test Limit

Limits for GSM 400, GSM 700, T-GSM 810, GSM 850 and GSM 900 sensitivity

| Channels | Propagation conditions TUhigh | | Propagation conditions RA | | Propagation conditions HT | | Static conditions | |
|---------------------------|-------------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|-------------------------|------------------------|
| | Test limit error rate % | Minimum No. of samples | Test limit error rate % | Minimum No. of samples | Test limit error rate % | Minimum No. of samples | Test limit error rate % | Minimum No. of samples |
| TCH/FS FER class Ib(RBER) | 6,742* α | 8 900 | | | | | 0,122* α | 164 000 |
| class II(RBER) | 0,42/ α | 1 000 | | | | | 0,41/ α | 20 000 |
| | 8,333 | 000 | 7,5 | 24 000 | 9,333 | 63 000 | 2,439 | 8 200 |

Limits for DCS 1 800 and PCS 1 900 sensitivity

| Channels | Propagation conditions TUhigh | | Propagation conditions RA | | Propagation conditions HT | | Static conditions | |
|---------------------------|-------------------------------|------------------------|---------------------------|------------------------|---------------------------|------------------------|-------------------------|------------------------|
| | Test limit error rate % | Minimum No. of samples | Test limit error rate % | Minimum No. of samples | Test limit error rate % | Minimum No. of samples | Test limit error rate % | Minimum No. of samples |
| TCH/FS FER class Ib(RBER) | 4478* α | 13400 | | | | | 0,122* α | 164 000 |
| class II(RBER) | 0.32/ α | 1 500 | | | | | 0,41/ α | 20 000 |
| | 8,333 | 000 | 7,5 | 24 000 | 9,333 | 30 000 | 2,439 | 8 200 |

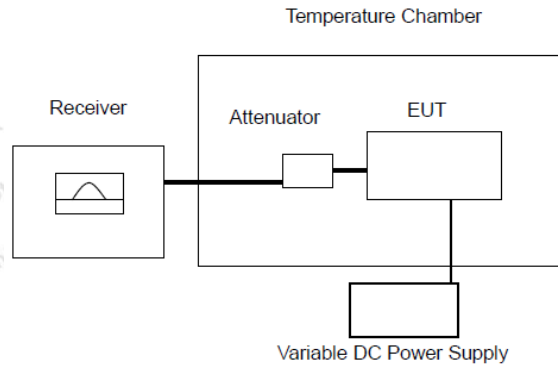
Limits for FACCH/F sensitivity

| | | | GSM 400, GSM 700, T-GSM 810, GSM 850 and GSM 900 | | DCS 1 800 and PCS 1 900 | |
|----------|----------------------------------|--------|--|-----------------------|-------------------------|-----------------------|
| Channels | Type of Propagation measurements | | Test limit error rate % | Minimum No of samples | Test limit error rate % | Minimum No of samples |
| FACCH/F | FER | TUhigh | 8,961 | 6696 | 4,368 | 13736 |

17.2. Test Procedures

1. Please refer to ETSI TS 151 010-1 clause 14.2.1.4&14.2.3.4 for the measurement method.

17.3. Test Setup



17.4. Test Results

| Reference sensitivity - TCH/FS(GSM900) | | | | |
|--|----------------|---------------|----------------|--------|
| Test style | Test condition | Channel (MHz) | No. of samples | Result |
| FER | TUhigh | 902.6 | 8900 | Pass |
| | Static | | 164000 | Pass |
| class Ib(RBER) | TUhigh | 902.6 | 1000000 | Pass |
| | Static | | 20000000 | Pass |
| class II(RBER) | TUhigh | 902.6 | 120000 | Pass |
| | RA | | 24000 | Pass |
| | HT | | 63000 | Pass |
| | Static | | 8200 | Pass |
| $\alpha = 1$ | | | | |

| Reference sensitivity - TCH/FS(DCS1800) | | | | |
|---|----------------|---------------|----------------|--------|
| Test style | Test condition | Channel (MHz) | No. of samples | Result |
| FER | TUhigh | 1747.4 | 13400 | Pass |
| | Static | | 164000 | Pass |
| class Ib(RBER) | TUhigh | 1747.4 | 1500000 | Pass |
| | Static | | 20000000 | Pass |
| class II(RBER) | TUhigh | 1747.4 | 63000 | Pass |
| | RA | | 24000 | Pass |
| | HT | | 30000 | Pass |
| | Static | | 82000 | Pass |
| $\alpha = 1$ | | | | |

| Reference sensitivity - TCH/FS(GSM900) | | | | |
|--|----------------|---------------|----------------|--------|
| Test style | Test condition | Channel (MHz) | No. of samples | Result |
| FER | TUhigh | 902.6 | 7000 | Pass |

| Reference sensitivity - TCH/FS(DCS1800) | | | | |
|---|----------------|---------------|----------------|--------|
| Test style | Test condition | Channel (MHz) | No. of samples | Result |
| FER | TUhigh | 1747.4 | 14000 | Pass |

18. Reference Sensitivity

18.1. Test Limit

The block error rate (BLER) performance for PDTCH/MCS1 to 4 shall not exceed 10 % at input levels according to the table 14.18-3a; and for PDTCH/MCS5 to 9 shall not exceed 10 % or 30 % depending on Coding Schemes at input levels according to the table 14.18-3b.

Table 14.18-3a: PDTCH Sensitivity Input Level for GMSK modulation

| Type of channel | | Propagation conditions | | | | |
|--|-----|------------------------|-------------------|----------------------|---------------|---------------|
| | | static | TUhigh (no FH) | TUhigh (ideal FH) | RA (no FH) | HT (no FH) |
| GSM 400, GSM 700, GSM 850 and GSM 900 | | | | | | |
| PDTCH/CS-1 | dBm | -104 | -102.5 | -103 | -103 | -102 |
| PDTCH/CS-2 | dBm | -104 | -100.5 | -101 | -100.5 | -100 |
| PDTCH/CS-3 | dBm | -104 | -96.5 | -96.5 | -92.5 | -95.5 |
| PDTCH/CS-4 | dBm | -101.5 | -91 | -91 | (note) | (note) |
| DCS 1 800 and PCS 1 900 | | | | | | |
| PDTCH/CS-1 | dBm | -104 | -102.5 | -103 | -103 | -101.5 |
| PDTCH/CS-2 | dBm | -104 | -100.5 | -101 | -100.5 | -99.5 |
| PDTCH/CS-3 | dBm | -104 | -96.5 | -96.5 | -92.5 | -94.5 |
| PDTCH/CS-4 | dBm | -101.5 | -90.5 | -90.5 | (note) | (note) |
| NOTE: PDTCH/MCS-4 can not meet the reference performance for some propagation conditions | | | | | | |

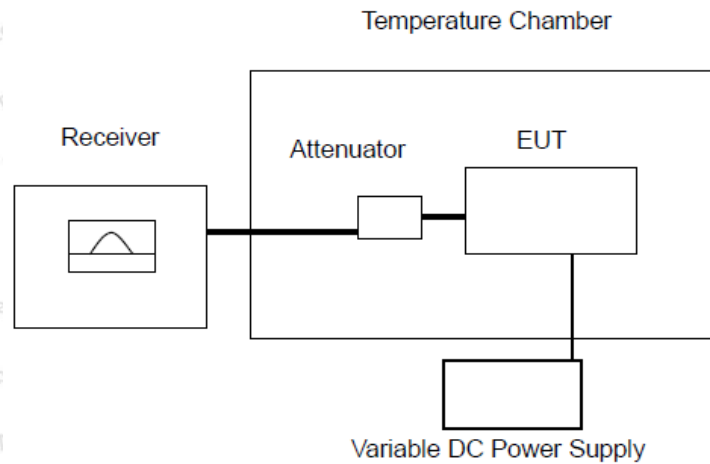
PDTCH Sensitivity Input Level for MS for 8-PSK modulation

| Type of channel | | Propagation conditions | | | | |
|--|-----|------------------------|-------------------|----------------------|---------------|---------------|
| | | static | TUhigh (no FH) | TUhigh (ideal FH) | RA (no FH) | HT (no FH) |
| GSM 400, GSM 700, GSM 850 and GSM 900 | | | | | | |
| PDTCH/CS-5 | dBm | -98 | -93 | -94 | -93 | -92 |
| PDTCH/CS-6 | dBm | -96 | -91 | -91.5 | -88 | -89 |
| PDTCH/CS-7 | dBm | -93 | -84 | -84 | (note 2) | (note 2) |
| PDTCH/CS-8 | dBm | 90.5 | -83(note 3) | -83(note 3) | (note 2) | (note 2) |
| PDTCH/CS-9 | dBm | -86 | -78.5(note 3) | -78.5(note 3) | (note 2) | (note 2) |
| DCS 1 800 and PCS 1 900 | | | | | | |
| PDTCH/CS-5 | dBm | -98 | -93.5 | -93.5 | -93 | -89.5 |
| PDTCH/CS-6 | dBm | -96 | -91 | -91 | -88 | -83.5 |
| PDTCH/CS-7 | dBm | -93 | -81.5 | -80.5 | (note 2) | (note 2) |
| PDTCH/CS-8 | dBm | -90.5 | -80(note 3) | -80(note 3) | (note 2) | (note 2) |
| PDTCH/CS-9 | dBm | -86 | (note 2) | (note 2) | (note 2) | (note 2) |
| NOTE: PDTCH/MCS-4 can not meet the reference performance for some propagation conditions | | | | | | |

18.2. Test Procedures

1. Please refer to ETSI TS 151 010-1 clause 14.18.1.4 for the measurement method.

18.3. Test Setup



18.4. Test Results

| GSM900(GMSK) | | | | | |
|--------------|-------------------|---------------|-------------------|-------------|-----------|
| Test style | Test condition | Channel (MHz) | Input level(dBm)) | Reading (%) | Limit (%) |
| PDTCH/CS-1 | static | 902.6 | -104 | 1.18 | 10 |
| | TUhigh (no FH) | | -102.5 | 1.08 | |
| | TUhigh (ideal FH) | | -103 | 1.73 | |
| | RA (no FH) | | -103 | 1.90 | |
| | HT (no FH) | | -102 | 0.90 | |
| PDTCH/CS-2 | static | 902.6 | -104 | 1.03 | 10 |
| | TUhigh (no FH) | | -100.5 | 1.93 | |
| | TUhigh (ideal FH) | | -101 | 1.77 | |
| | RA (no FH) | | -100.5 | 1.15 | |
| | HT (no FH) | | -100 | 0.29 | |
| PDTCH/CS-3 | static | 902.6 | -104 | 0.87 | 10 |
| | TUhigh (no FH) | | -96.5 | 0.79 | |
| | TUhigh (ideal FH) | | -96.5 | 0.46 | |
| | RA (no FH) | | -92.5 | 1.31 | |
| | HT (no FH) | | -95.5 | 0.32 | |
| PDTCH/CS-4 | static | 902.6 | -101.5 | 1.36 | 10 |
| | TUhigh (no FH) | | -91 | 1.15 | |
| | TUhigh (ideal FH) | | -91 | 1.18 | |

| DCS1800(GMSK) | | | | | |
|---------------|-------------------|---------------|-------------------|-------------|-----------|
| Test style | Test condition | Channel (MHz) | Input level(dBm)) | Reading (%) | Limit (%) |
| PDTCH/CS-1 | static | 1747.4 | -104 | 0.61 | 10 |
| | TUhigh (no FH) | | -102.5 | 1.69 | |
| | TUhigh (ideal FH) | | -103 | 1.39 | |
| | RA (no FH) | | -103 | 0.54 | |
| | HT (no FH) | | -101.5 | 1.62 | |
| PDTCH/CS-2 | static | 1747.4 | -104 | 1.89 | 10 |
| | TUhigh (no FH) | | -100.5 | 1.35 | |
| | TUhigh (ideal FH) | | -101 | 1.29 | |
| | RA (no FH) | | -100.5 | 1.03 | |
| | HT (no FH) | | -99.5 | 0.84 | |
| PDTCH/CS-3 | static | 1747.4 | -104 | 0.38 | 10 |
| | TUhigh (no FH) | | -96.5 | 0.80 | |
| | TUhigh (ideal FH) | | -96.5 | 1.02 | |
| | RA (no FH) | | -92.5 | 0.58 | |
| | HT (no FH) | | -94.5 | 0.19 | |
| PDTCH/CS-4 | static | 1747.4 | -101.5 | 0.65 | 10 |
| | TUhigh (no FH) | | -90.5 | 1.33 | |
| | TUhigh (ideal FH) | | -90.5 | 1.73 | |

19. PICS/PIXIT Information of The EUT

Type of Mobile Station (Re. ETSI EN301 511 Annex A)

| Item | Type of Mobile Station | Support | Mnemonic |
|------|--|---------|----------------------------|
| 1 | HSCSD Multislot MS | N | Type_HSCSD_Multislot |
| 2 | R-GSM MS | N | Type_R-GSM |
| 3 | Support of GPRS Multislot class on the uplink | Y | Type_GPRS_Multislot_uplink |
| 4 | EGPRS | Y | Type_EGPRS |
| 5 | EGPRS capable of 8PSK in Uplink, of all Multislot classes | Y | Type_EGPRS_8PSK_uplink |

ADDITIONAL INFORMATION (Re. ETSI EN301 511 Annex A)

| Item | Additional Information | Support | Mnemonic |
|------|------------------------------|---------|--------------------------|
| 1 | Telephony. | Y | TSPC_Serv_TS11 |
| 2 | Permanent Antenna Connector. | N | TSPC_AddInfo_PermAntenna |

20. Test setup photo

Photo of Radiation Emission Test



----- End of Report -----