**Important Product Records**

**Service that adds value**

i Worldwide

i Local and personalized

i Customized and flexible

i Uncompromising quality

i Long-term dependability



e. g. Calibration Certificate, License Keys List

**<$>**

ROHDE&SCHWARZ



Material No.

1173**.**6506.02

Serial No.

102416

GU DCV- PAPIERAUSDRUCK

DCV-ZP

**Calibration Certificate Certificate Number 20-502125**

Kalibrierschein

Zertifikatsnummer

Order Data

**Customer**

Auftraggeber

**This calibration certificate documents, that the named item is tested and measured against defined specifications.**

**Measurement results are located usually in the corresponding interval with a probability of approx. 95% (coverage factor k = 2).**

**Calibration is performed with test equipment and standards directly or indirectly traceable by means of approved calibration techniques to the PTB/DKD or other national / international standards, which realize the physical units of measurement according to the International System of Units (SI).**

**In all cases where no standards are available, measurements are referenced to standards of the R&S laboratories.**

**Principles and methods of calibration correspond and are conformant with EN ISO/IEC 17025, ANSI/NCSL Z540.1-1994 and ANSI/NCSL Z540.3-2006. The applied quality system is certified to EN ISO 9001.**

**This calibration certificate may not be reproduced other than in full. Calibration certificates without signatures are not valid.**

**The user is obliged to have the object recalibrated at appropriate intervals.**

Dieser Kalibrierschein dokumentiert, dass der genannte Gegenstand nach festgelegten Vorgaben gepriift und gemessen wurde. Die Messwerte lagen im Regelfall mit einer Wahrscheinlichkeit von annahernd 95% im zugeordneten Werteintervall (Erweiterte Messunsicherheit mit k = 2).

Die Kalibrierung erfolgte mit Messmitteln und Normalen, die direkt Oder indirekt durch Ableitung mittels anerkannter Kalibriertechniken ruckgefuhrt sind auf Normale der PTB/DKD Oder anderer nationaler/internationaler Standards zur Darstellung der physikalischen Einheiten in Ubereinstimmung mit dem Internationalen Einheitensystem (SI). Wenn keine Normale existieren, erfolgt die Ruckfuhrung auf Bezugsnormaie der R&S- Laboratorien.

Grundsatze und Verfahren der Kalibrierung beziehen sich auf und entsprechen EN ISO/IEC 17025, ANSI/ NCSL Z540.1-1994 und ANSI/NCSL Z540.3-2006.

Das angewandte Qualitatsmanagement- System ist zertifiziert nach EN ISO 9001. Dieser Kalibrierschein darf nur vollstandig und unverandert weiterverbreitet werden. Kalibrierscheine ohne Signifizierungen sind ungultig.

Fur die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

###### Rohde & Schwarz Messgeratebau GmbH

**Date of Issue**

Ausstellungsdatum

**Head of Laboratory**

jorleitung

2014-08-11



**Person Responsible**

Bearbeiter

## C/(/cd^

Gerald Nickel

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ver9815/MB0707

Rohde & Schwarz Messgeratebau GmbH • Postfach 1652 D-87686 Memmingen • Rohde-und-Schwarz-Str. 1 D-87700 Memmingen  
Telefon national: 08331/10-80; international: 0049 8331/10-80; Fax: 08331/10-811 24  
Geschaftsfuhrer: Jurgen Steigmuller • Aufsichtsratsvorsitzender: Roland Steffen  
Sitz der Gesellschaft: Munchen • Registereintrag: Amtsgericht Munchen HRB 1059

|  |  |  |  |
| --- | --- | --- | --- |
| Unit Data |  | |  |
| **Item**  Gegenstand | **TSML-CW RADIO NETWORK ANALYZER** | | |
| **Manufacturer**  Hersteller | **ROHDE & SCHWARZ** | |  |
| **Type**  Typ | **TSML-CW** | |  |
| **Material Number**  Materialnummer | **1153.6000.15** | **Serial Number**  Seriennummer | **100124** |
| **Asset Number**  Inventamummer |  | |  |

|  |  |
| --- | --- |
| **Order Number 0000291929**  Bestellnummer |  |
| **Date of Receipt 2014-08-11**  Eingangsdatum |  |
| Performance |  |
| **Place and Date of Calibration**  Ort und Datum der Kalibrierung | **Memmingen, 2014-08-11** |
| **Scope of Calibration**  Umfang der Kalibrierung | **Standard Calibration** |
| **Statement of Compliance (Incoming)**  Konformitatsaussage  (Anlieferung) | **New device** |
| **Statement of Compliance (Outgoing)**  Konformitatsaussage  (Auslieferung) | **Measurement results within specifications** |
| **Extent of Calibration Documents**  Umfang des Kalibrierdokuments | **2 Pages Calibration Certificate 5 Pages Outgoing Results** |

Ref. No.20-502125

|  |  |
| --- | --- |
| **Cal.** | **Custom. Due Date** |
| **2014-08-11** |  |

###### **Calibration Method** 1153.6000.01 -T- 08.01

Kalibrieranweisung

**Ambient Temperature 23 +7-3**

Umgebungstemperatur

**Relative Humidity 20%-60%**

Relative Luftfeuchte

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Working standards used (having a significant effect on the accuracy)**  Verwendete Gebrauchsnormale (mit signifikantem Einfluss auf die Genauigkeit) | | | | |
| **Item** | **Type** | **Serial Number** | **Calibration Certificate Number** | **Cal. Due** |
| Gegenstand | Typ | Seriennummer | Kalibrierscheinnummer | Kalibr. bis |
| **Average Power Sensor** | **NRP-Z11** | **100473** | **0410-D-K-15195-01 -00-2013-07** | **2015-07-31** |
| **Vector Signal Generator** | **SMIQ06B** | **838341/040** | **0082-DKD-K-15195-2013-05** | **2016-04-30** |

**Conformity statements take the measurement uncertainties into account.**

Die Konformitatsaussagen beriicksichtigen die Messunsicherheiten.

**Notes**

Anmerkungen

Installed options are included in calibration. Depending on installed options, numbers of pages of the record are not consecutive.

Outgoing Results

|  |  |
| --- | --- |
| **Designation:** | **Radio Network Analyzer** |
| **Type:**  **Material No.: Serial No.:** | **TSML-CW**  **1153.6000.15**  **100124** |
| **Referring to Test Documentation:** | **1153.6000.01-T-08.01** |

|  |  |
| --- | --- |
| **Test Department: ME1A Name: Nickel**  **Date: 2014-08-11** |  |

|  |  |
| --- | --- |
| **ROHDE&SCHWARZ** | **Page**  **1/5** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type** | **TSML-CW** | **Serial No.** | **100124** |  |
| **Test System** | **T10010** | **Material No.** | **1153.6000.15** | **ROHDE&SCHWARZ** |
| **Temperature** | **(23 -3/+7)°C** | **Date** | **2014-08-11** |
| **File** | **1153.6000.15\_100124\_10-.MF** |  |  |  |
| **Page** | **2/5** |  |  |  |

### Table of contents

Software used for measurement

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4

1. Protocol

Type TSML-CW Serial No. 100124

Test System T10010 Material No. 1153.6000.15

<8>

ROHDE&SCHWARZ

Temperature (23-36-7)°C Date 2014-0&-11

File 1153.6000.15\_100124\_10-.MF

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|  |  |  |  |
| --- | --- | --- | --- |
| **Software used for measurement**  **Item** | **Type** | **Version** | **Remark** |
| Suite  Test Program (010121J | Setup  Component | V10.10  V08.01 | Test Management Software G5 |

**Type**

**Test System Temperature File Page**

<>

ROHDE&SCHWARZ

TSML-CW **T10010** (23 -3/+7)°C

1153.6000.15\_100124\_10-.MF 4/5

Serial No. 100124

Material No. 1153.6000.15

Date 2014-08-11

1. Protocol

Report generated with mask: Skript5\_TSML-CW Begin:

Program Version Calibration Version

Auto Power On Mode

Power Off Mode

IEEE1394 Communication

IF-Filter Adjustment

Level Calibration

Bandwidth 3dB IF-Filter Valid Range

Level Accuracy Start Frequency Stop Frequency Frequency Step Calculation Interval

7 . 00

1.04

O.K.

O.K.

O.K.

O.K.

O.K.

4.541 MHz

4.275 MHz to 4.725 MHz

0080 MHz 3921 MHz 0001 MHz 0500 MHz

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Amplifier Setting | | Pre-Amp | on, IF | -Amp | | 15db |  |  |
| Input | Power | -50.00 dBm | |  |  |  |  |  |
| Frequency | | Measured | Accuracy | | [dB/100] | |  |  |
|  |  | Average | Max |  |  | Frequ.[MHz] | Rated | Uncertainty |
| 0080 . . | .0500 MHz | + /-01 | + 04 |  |  | 0115 | + /-70 | + /-30 |
| 0501 . . | .1000 MHz | + /-01 | + 04 |  |  | 0703 | + /-70 | + /-30 |
| 1001 . . | .1500 MHz | + /-01 | + 04 |  |  | 1317 | + /-70 | + /-30 |
| 1501 . . | .2000 MHz | + /-01 | + 04 |  |  | 1571 | + /-70 | + /-30 |
| 2001 . . | .2500 MHz | + /-01 | + 03 |  |  | 2009 | + /-70 | + /-30 |
| 2501 . . | .3000 MHz | + /-01 | + 03 |  |  | 2507 | + /-70 | + /-30 |
| 3001 . . | .3500 MHz | + /-01 | + 04 |  |  | 3045 | + /-70 | + /-30 |
| 3501 . . | .4000 MHz | + /-00 | + 03 |  |  | 3573 | + /-70 | + /-30 |
| Amplifier Setting | | Pre-Amp Off, IF Amp 15db | | | | |  |  |
| Input | Power | -40.00 dBm | |  |  |  |  |  |
| Frequency | | Measured | Accuracy | | [dB/100] | |  |  |
|  |  | Average | Max |  |  | Frequ.[MHz] | Rated | Uncertainty |
| 0080 . . | .0500 MHz | + /-00 | + 03 |  |  | 0129 | + /-70 | + /-30 |
| 0501 . . | .1000 MHz | + /-01 | + 03 |  |  | 0538 | + /-70 | + /-30 |
| 1001 . . | .1500 MHz | + /-00 | + 03 |  |  | 1245 | + /-70 | + /-30 |
| 1501 . . | .2000 MHz | + /-00 | + 03 |  |  | 1938 | + /-70 | + /-30 |
| 2001 . . | .2500 MHz | + /-00 | + 03 |  |  | 2089 | + /-70 | + /-30 |
| 2501 . . | .3000 MHz | + /-00 | + 03 |  |  | 2580 | + /-70 | + /-30 |
| 3001 . . | .3500 MHz | + /-00 | + 04 |  |  | 3047 | + /-70 | + /-30 |
| 3501 . . | .4000 MHz | + /-00 | + 03 |  |  | 3605 | + /-70 | + /-30 |

TSML-CW T10010 (23 -3/+7)°C

1153.6000.15\_100124\_10- .M F 5/5

**<$>**

ROHDE&SCHWARZ

**Type**

**Test System Temperature File Page**

**Serial No. Material No. Date**

**100124**

**1153.6000.15**

**2014-08-11**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Amplifier Setting | | | | | Pre-Amp off, IF-Amp 5db | | | | | | | | | | | | | | |  | | |  | | |  | | |
| Input | Power | | | | -30.00 dBm | | | | | |  | | |  |  |  | | | |  | | |  | | |  | | |
| Frequency | | | | | Measured Accuracy | | | | | | | | | | [dB/100] | | | | |  | | |  | | |  | | |
|  | |  | | | Average | | |  | | | Max | | |  |  | Frequ. | | | | [MHz] | | | Rated | | | Uncertainty | | |
| 0080.. | | .0500 MHz | | | + /-01 | | |  | | | +05 | | | |  | 0324 | | | |  | | | + /-70 | | | + /-30 | | |
| 0501.. | | .1000 MHz | | | + /-01 | | |  | | | +06 | | | |  | 0590 | | | |  | | | + /-70 | | | + /-30 | | |
| 1001.. | | .1500 MHz | | | + /-01 | | |  | | | +04 | | | |  | 1025 | | | |  | | | + /-70 | | | + /-30 | | |
| 1501.. | | .2000 MHz | | | + /-01 | | |  | | | +05 | | | |  | 1588 | | | |  | | | + /-70 | | | + /-30 | | |
| 2001 . . | | .2500 MHz | | | + /-02 | | |  | | | -06 | | | |  | 2231 | | | |  | | | + /-70 | | | + /-30 | | |
| 2501 . . | | .3000 MHz | | | + /-03 | | |  | | | +09 | | | |  | 2666 | | | |  | | | + /-70 | | | + /-30 | | |
| 3001.. | | .3500 MHz | | | + /-03 | | |  | | | -10 | | | |  | 3119 | | | |  | | | + /-70 | | | + /-30 | | |
| 3501.. | | .4000 MHz | | | + /-04 | | |  | | | +12 | | | |  | 3846 | | | |  | | | + /-70 | | | + /-30 | | |
| Amp1ifier Setting | | | | | Pre-Amp off, IF-Amp off | | | | | | | | | | | | | | |  | | |  | | |  | | |
| Input | | Power | | | -25.00 dBm | | | | | |  | | |  |  |  | | | |  | | |  | | |  | | |
| Frequency | | | | | Measured Accuracy | | | | | | | | | | [dB/100] | | | | |  | | |  | | |  | | |
|  | | | |  | | | Average | | |  | | | Max | |  | |  | | Frequ. | | | [MHz] | | | Rated | | | Uncertainty | | |
| 0080 . . | | | | .0500 MHz | | | + /-01 | | |  | | | +06 | | | |  | | 0324 | | |  | | | + /-70 | | | + /-30 | | |
| 0501 . . | | | | .1000 MHz | | | + /-03 | | |  | | | +09 | | | |  | | 0835 | | |  | | | + /-70 | | | + /-30 | | |
| 1001 . . | | | | .1500 MHz | | | + /-03 | | |  | | | +11 | | | |  | | 1336 | | |  | | | + /-70 | | | + /-30 | | |
| 1501 . . | | | | .2000 MHz | | | + /-02 | | |  | | | -09 | | | |  | | 1878 | | |  | | | + /-70 | | | + /-30 | | |
| 2001 . . | | | | .2500 MHz | | | + /-06 | | |  | | | -22 | | | |  | | 2361 | | |  | | | + /-70 | | | + /-30 | | |
| 2501 . . | | | | .3000 MHz | | | + /-07 | | |  | | | -20 | | | |  | | 2848 | | |  | | | + /-70 | | | + /-30 | | |
| 3001 . . | | | | .3500 MHz | | | + /-03 | | |  | | | -18 | | | |  | | 3298 | | |  | | | + /-70 | | | + /-30 | | |
| 3501 . . | | | | .4000 MHz | | | + /-01 | | |  | | | -07 | | | |  | | 3804 | | |  | | | + /-70 | | | + /-30 | | |
| Amplifier Setting | | | | | Low Level Meas: Pre-Amp on, IF-Amp 15db | | | | | | | | | | | | | | | | | | | | |  | | |
| Input | Power | | | | -69.70 dBm | | | | | |  | | |  |  |  | | | |  | | |  | | |  | | |
| Frequency | | | | | Measured Accuracy | | | | | | | | | | [dB/100] | | | | |  | | |  | | |  | | |
|  | | |  | | | Average | | |  | | | Max | | |  |  | | Frequ. | | | [MHz] | | | Rated | | | Uncertainty | | |
| 0080 . . | | | .0500 MHz | | | + /-07 | | |  | | | +16 | | |  |  | | 0112 | | |  | | | + /-70 | | | + /-70 | | |
| 0501 . . | | | .1000 MHz | | | + /-07 | | |  | | | +15 | | |  |  | | 0750 | | |  | | | + /-70 | | | + /-70 | | |
| 1001 . . | | | .1500 MHz | | | + /-06 | | |  | | | +15 | | |  |  | | 1250 | | |  | | | + /-70 | | | + /-70 | | |
| 1501 . . | | | .2000 MHz | | | + /-04 | | |  | | | +13 | | |  |  | | 1734 | | |  | | | + /-70 | | | + /-70 | | |
| 2001 . . | | | .2500 MHz | | | + /-03 | | |  | | | +13 | | |  |  | | 2364 | | |  | | | + /-70 | | | + /-70 | | |
| 2501 . . | | | .3000 MHz | | | + /-03 | | |  | | | +10 | | |  |  | | 2564 | | |  | | | + /-70 | | | +/-110 | | |
| 3001 . . | | | .3500 MHz | | | + /-03 | | |  | | | -20 | | |  |  | | 3200 | | |  | | | + /-70 | | | +/-110 | | |
| 3501 . . | | | .4000 MHz | | | + /-03 | | |  | | | -15 | | |  |  | | 3923 | | |  | | | + /-70 | | | +/-110 | | |

Filter Calibration End:

O.K.