

# Important Product Records

e. g. Calibration Certificate, License Keys List

## Service that adds value

- | Worldwide
- | Local and personalized
- | Customized and flexible
- | Uncompromising quality
- | Long-term dependability



**ROHDE & SCHWARZ**



100021486627

1 /1

MLD

Material No.

**1173.6506.02**

Serial No.

**102417**

GU DCV – ZP DCV – PAPIERAUSDRUCK

**DCV – ZP**

# Calibration Certificate

Certificate Number 20-502127

Kalibrierschein

Zertifikatsnummer

## 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 **100125**

Asset Number  
Inventarnummer

## Order Data

Customer  
Auftraggeber

Order Number  
Bestellnummer **0000291929**

Date of Receipt  
Eingangsdatum **2014-08-11**

## 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)  
Konformitätsaussage  
(Anlieferung)

**New device**

Statement of Compliance  
(Outgoing)  
Konformitätsaussage  
(Auslieferung)

**Measurement results within specifications**

Extent of Calibration Documents  
Umfang des Kalibrierdokuments

**2 Pages Calibration Certificate  
5 Pages Outgoing Results**

Ref. No. **20-502127**

Cal. 2014-08-11 Custom. Due Date

ROHDE & SCHWARZ

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 geprüft und gemessen wurde. Die Messwerte lagen im Regelfall mit einer Wahrscheinlichkeit von annähernd 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 rückgeführt sind auf Normale der PTB/DKD oder anderer nationaler/internationaler Standards zur Darstellung der physikalischen Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI). Wenn keine Normale existieren, erfolgt die Rückführung auf Bezugsnormale der R&S-Laboratorien.

Grundsätze 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 Qualitätsmanagement-System ist zertifiziert nach EN ISO 9001. Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Kalibrierscheine ohne Signifizierungen sind ungültig.

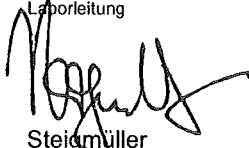
Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

## Rohde & Schwarz Messgerätebau GmbH

Date of Issue  
Ausstellungsdatum

2014-08-11

Head of Laboratory  
Laborleitung

  
Steigmüller

Person Responsible  
Bearbeiter

  
Gerald Nickel

Page 1/2  
ver5815/MB0707

Calibration Method 1153.6000.01-T- 08.01  
Kalibrieranweisung

Relative Humidity 20%-60%  
Relative Luftfeuchte

Ambient Temperature (23 <sup>+7</sup><sub>-3</sub>) °C  
Umgebungstemperatur

**Working standards used (having a significant effect on the accuracy)**

Verwendete Gebrauchsnormale (mit signifikantem Einfluss auf die Genauigkeit)

Item Gegenstand	Type Typ	Serial Number Seriennummer	Calibration Certificate Number Kalibrierscheinnummer	Cal. Due Kalibr. bis
Average Power Sensor Vector Signal Generator	NRP-Z11 SMIQ06B	100473 838341/040	0410-D-K-15195-01-00-2013-07 0082-DKD-K-15195-2013-05	2015-07-31 2016-04-30

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

Die Konformitätsaussagen berücksichtigen 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:	TSML-CW
Material No.:	1153.6000.15
Serial No.:	100125
Referring to Test Documentation:	1153.6000.01-T-08.01

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



# Table of contents

Software used for measurement .....	3
1. Protocol .....	4

Type TSML-CW  
Test System T10010  
Temperature (23-3/+7)°C  
File 1153.6000.15\_100125\_10-MF  
Page 3 / 5

Serial No. 100125  
Material No. 1153.6000.15  
Date 2014-08-11



Software used for measurement

Item	Type	Version	Remark
Suite	Setup	V10.10	Test Management Software G5
Test Program (010121_)	Component	V08.01	

Type TSML-CW  
Test System T10010  
Temperature (23-3/+7)°C  
File 1153.6000.15\_100125\_10-MF  
Page 4 / 5

Serial No. 100125  
Material No. 1153.6000.15  
Date 2014-08-11



## 1. Protocol

Report generated with mask: Skript5\_TSML-CW

Begin:-----

Program Version 7.00  
Calibration Version 1.04

Auto Power On Mode O.K.

Power Off Mode O.K.

IEEE1394 Communication O.K.

IF-Filter Adjustment O.K.

Level Calibration O.K.

Bandwidth 3dB IF-Filter 4.443 MHz  
Valid Range 4.275 MHz to 4.725 MHz

Level Accuracy  
Start Frequency 0080 MHz  
Stop Frequency 3921 MHz  
Frequency Step 0001 MHz  
Calculation Interval 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	+/-03	+06	0124	+/-70	+/-30
0501...1000 MHz	+/-03	+05	0509	+/-70	+/-30
1001...1500 MHz	+/-03	+06	1380	+/-70	+/-30
1501...2000 MHz	+/-03	+06	1550	+/-70	+/-30
2001...2500 MHz	+/-02	+05	2338	+/-70	+/-30
2501...3000 MHz	+/-03	+06	2646	+/-70	+/-30
3001...3500 MHz	+/-02	+05	3219	+/-70	+/-30
3501...4000 MHz	+/-01	+05	3525	+/-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	+/-01	+04	0313	+/-70	+/-30
0501...1000 MHz	+/-01	+04	0509	+/-70	+/-30
1001...1500 MHz	+/-02	+04	1026	+/-70	+/-30
1501...2000 MHz	+/-01	+04	1537	+/-70	+/-30
2001...2500 MHz	+/-01	+04	2452	+/-70	+/-30
2501...3000 MHz	+/-01	+05	2734	+/-70	+/-30
3001...3500 MHz	+/-01	+03	3013	+/-70	+/-30
3501...4000 MHz	+/-00	+03	3508	+/-70	+/-30

Type TSM-L-CW  
Test System T10010  
Temperature (23 -3/+7)°C  
File 1153.6000.15\_100125\_10-MF  
Page 5 / 5

Serial No. 100125  
Material No. 1153.6000.15  
Date 2014-08-11



Amplifier Setting Pre-Amp off, IF-Amp 5db  
Input Power -30.00 dBm

Frequency -----	Measured Accuracy [dB/100]		Frequ. [MHz]	Rated	Uncertainty
	Average	Max			
0080...0500 MHz	+/-01	+04	0324	+/-70	+/-30
0501...1000 MHz	+/-01	+04	0590	+/-70	+/-30
1001...1500 MHz	+/-01	+05	1284	+/-70	+/-30
1501...2000 MHz	+/-01	-06	1654	+/-70	+/-30
2001...2500 MHz	+/-02	-06	2237	+/-70	+/-30
2501...3000 MHz	+/-03	+10	2958	+/-70	+/-30
3001...3500 MHz	+/-03	-11	3108	+/-70	+/-30
3501...4000 MHz	+/-04	-12	3998	+/-70	+/-30

Amplifier Setting Pre-Amp off, IF-Amp off  
Input Power -25.00 dBm

Frequency -----	Measured Accuracy [dB/100]		Frequ. [MHz]	Rated	Uncertainty
	Average	Max			
0080...0500 MHz	+/-01	-04	0218	+/-70	+/-30
0501...1000 MHz	+/-03	-10	0933	+/-70	+/-30
1001...1500 MHz	+/-03	-10	1245	+/-70	+/-30
1501...2000 MHz	+/-02	-11	1870	+/-70	+/-30
2001...2500 MHz	+/-07	-25	2361	+/-70	+/-30
2501...3000 MHz	+/-08	-20	2833	+/-70	+/-30
3001...3500 MHz	+/-05	-22	3297	+/-70	+/-30
3501...4000 MHz	+/-03	-09	3815	+/-70	+/-30

Amplifier Setting Low Level Meas: Pre-Amp on, IF-Amp 15db  
Input Power -69.70 dBm

Frequency -----	Measured Accuracy [dB/100]		Frequ. [MHz]	Rated	Uncertainty
	Average	Max			
0080...0500 MHz	+/-09	+17	0087	+/-70	+/-70
0501...1000 MHz	+/-09	+17	0800	+/-70	+/-70
1001...1500 MHz	+/-09	+20	1423	+/-70	+/-70
1501...2000 MHz	+/-06	+13	1752	+/-70	+/-70
2001...2500 MHz	+/-05	+15	2369	+/-70	+/-70
2501...3000 MHz	+/-07	+14	2818	+/-70	+/-110
3001...3500 MHz	+/-04	+16	3275	+/-70	+/-110
3501...4000 MHz	+/-02	+15	3525	+/-70	+/-110

Filter Calibration O.K.

End:-----