

Kalibrierschein-Nr. 2016/68
Fremdkalibrierung Rohde & Schwarz
Gegenstand:
Harmonic Mixer 60-90 GHz FS-Z90
Rohde & Schwarz
Ger.-Nr.: 501
Datum: 29.06.2016

Kalibrierschein-Nr. 2016/68
 Gegenstand: FS-Z90 - Ger.-Nr.: 501
 Datum: 29.06.2016

|  ROHDE & SCHWARZ | | Certificate Number 20-300391704 | | | | | | | | |
|---|--|---|-----------------------|--|------|------------------|------------|--|---|--|
| Calibration Certificate | | Zertifikatsnummer | | | | | | | | |
| Kalibrierschein | | Zertifikatsnummer | | | | | | | | |
| Unit Data | | | | | | | | | | |
| Item Gegenstand | NV HARM. MISCHER 60-90GHZ | | | | | | | | | |
| Manufacturer Hersteller | ROHDE & SCHWARZ | | | | | | | | | |
| Type Typ | FS-Z90 | | | | | | | | | |
| Material Number Materialnummer | 1089.0924.00 | Serial Number Seriennummer 100062 | | | | | | | | |
| Asset Number Inventarnummer | | | | | | | | | | |
| Order Data | | | | | | | | | | |
| Customer Auftraggeber | m.dudde hochfrequenz-technik Inh. Manfred Dudde | | | | | | | | | |
| | Rottland 5a 51429 Bergisch Gladbach DE | | | | | | | | | |
| Order Number Bestellnummer | 300-010813.2 | | | | | | | | | |
| Date of Receipt Eingangsdatum | 2016-06-10 | | | | | | | | | |
| Performance | | | | | | | | | | |
| Place and Date of Calibration Ort und Datum der Kalibrierung | Werk Memmingen, 2016-06-29 | | | | | | | | | |
| Scope of Calibration Umfang der Kalibrierung | Standard Calibration | | | | | | | | | |
| Statement of Compliance (Incoming) Konformitätsaussage (Anlieferung) | All measured values are within the data sheet specifications. | | | | | | | | | |
| Statement of Compliance (Outgoing) Konformitätsaussage (Auslieferung) | All measured values are within the data sheet specifications. | | | | | | | | | |
| Extent of Calibration Documents Umfang des Kalibrierdokuments | 2 Pages Calibration Certificate 2 Pages Outgoing Results | | | | | | | | | |
| <table border="1" style="width: 100%;"> <tr> <td colspan="2">Ref. No. 20-300391704</td> </tr> <tr> <td>Cal.</td> <td>Custom. Due Date</td> </tr> <tr> <td>2016-06-29</td> <td></td> </tr> <tr> <td colspan="2" style="text-align: center;"></td> </tr> </table> | | | Ref. No. 20-300391704 | | Cal. | Custom. Due Date | 2016-06-29 | |  | |
| Ref. No. 20-300391704 | | | | | | | | | | |
| Cal. | Custom. Due Date | | | | | | | | | |
| 2016-06-29 | | | | | | | | | | |
|  | | | | | | | | | | |
| Rohde & Schwarz Messgerätebau GmbH | | | | | | | | | | |
| Date of Issue Ausstellungsdatum | Head of Laboratory Laborleitung | Person Responsible Bearbeiter | | | | | | | | |
| 2016-06-29 |  Steigmüller |  Markus Vogt | | | | | | | | |
| | | Page 14 ver9815/MB0707 | | | | | | | | |
| <small>Rohde & Schwarz Messgerätebau 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 Geschäftsführer: Jürgen Steigmüller · Aufsichtsratsvorsitzender: Roland Steffen Sitz der Gesellschaft: München · Register: Amtsgericht München HRB 1059</small> | | | | | | | | | | |

PF 095-4987-0715

Kalibrierschein-Nr. 2016/68

Gegenstand: FS-Z90 - Ger.-Nr.: 501

Datum: 29.06.2016

Material Number 1089.0924.00

Serial Number 100062

Certificate Number 20-300391704

 Calibration Method 1048.1184.35-01.00
 Kalibrieranweisung

 Relative Humidity 20%-60%
 Relative Luftfeuchte

 Ambient Temperature (23 ⁺¹ ₋₁) °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 |
|----------------------------|-------------|-------------------------------|---|-------------------------|
| PNA Network Analyzer 67GHz | E8361A | US43140705 | 0153-D-K-15195-01-00-2016-04 | 2017-04-30 |
| Modular Frequency System | MFS | 6509/001 | 0167-D-K-15195-01-00-2014-01 | 2017-01-31 |
| WR-15 Verification Kit | V11645A | 3014A00219 | 967604-1551664-1 A2LA | 2017-02-28 |
| WR-10 Verification Kit | W11645A | 3104A00227 | 434904-1539789-1 A2LA | 2016-06-30 |
| Thermistor Mount | 45774H | 050 | 222 3032 PTB 14 | 2017-05-31 |
| Thermistor Mount | 45776H | 080 | 222 3080 PTB 14 | 2017-10-31 |

UGB1 A compliance statement may be possible where a confidence level of less than 95 % is acceptable.
 Die Bestätigung der Konformität ist möglich, sofern ein Grad des Vertrauens von weniger als 95 % akzeptabel ist.

UGB2 A non-compliance statement may be possible where a confidence level of less than 95 % is acceptable.
 Die Bestätigung der Nicht-Konformität ist möglich, sofern ein Grad des Vertrauens von weniger als 95 % akzeptabel ist.

Ref.: ILAC-G8:03/2009 'Guidelines on the Reporting of Compliance with Specification'

 Notes
 Anmerkungen

An LO-Level of 15.5 dBm is recommended.

RF-Input level -20 dBm

The measurement result is made using an analyzer R&S-FSV Ser. 100932 with option B21.

 Setting:
 Span 100 kHz
 RES BW 5 kHz
 Video BW 20 Hz
 LO-Level 15.5 dBm

The conversion loss comes with file format on USB-Stick.

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

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Gegenstand: FS-Z90 - Ger.-Nr.: 501

Datum: 29.06.2016

Material Number 1089.0899.02

Serial Number 100062

Certificate Number 20-300391704

Measurement results with LO-Level of 15.5 dBm

| Frequency / GHz | Conversion loss harmonic 6 specification / dB | Conversion loss harmonic 6 result / dB | Expanded uncertainty of measurement / dB |
|--------------------|--|---|--|
| 60.0 | ≤ 37.5 | 22.92 | 2.00 |
| 60.5 | ≤ 37.5 | 22.25 | 2.00 |
| 61.0 | ≤ 37.5 | 21.97 | 2.00 |
| 61.5 | ≤ 37.5 | 21.50 | 2.00 |
| 62.0 | ≤ 37.5 | 21.36 | 2.00 |
| 62.5 | ≤ 37.5 | 20.73 | 2.00 |
| 63.0 | ≤ 37.5 | 20.39 | 2.00 |
| 63.5 | ≤ 37.5 | 20.36 | 2.00 |
| 64.0 | ≤ 37.5 | 20.13 | 2.00 |
| 64.5 | ≤ 37.5 | 20.19 | 2.00 |
| 65.0 | ≤ 37.5 | 20.01 | 2.00 |
| 65.5 | ≤ 37.5 | 20.27 | 2.00 |
| 66.0 | ≤ 37.5 | 20.24 | 2.00 |
| 66.5 | ≤ 37.5 | 20.03 | 2.00 |
| 67.0 | ≤ 37.5 | 20.03 | 2.00 |
| 67.5 | ≤ 37.5 | 20.00 | 2.00 |
| 68.0 | ≤ 37.5 | 20.13 | 2.00 |
| 68.5 | ≤ 37.5 | 20.24 | 2.00 |
| 69.0 | ≤ 37.5 | 20.27 | 2.00 |
| 69.5 | ≤ 37.5 | 20.84 | 2.00 |
| 70.0 | ≤ 37.5 | 20.98 | 2.00 |
| 70.5 | ≤ 37.5 | 21.21 | 2.00 |
| 71.0 | ≤ 37.5 | 21.72 | 2.00 |
| 71.5 | ≤ 37.5 | 22.25 | 2.00 |
| 72.0 | ≤ 37.5 | 22.64 | 2.00 |
| 72.5 | ≤ 37.5 | 23.23 | 2.00 |
| 73.0 | ≤ 37.5 | 23.62 | 2.00 |
| 73.5 | ≤ 37.5 | 23.79 | 2.00 |
| 74.0 | ≤ 37.5 | 24.64 | 2.00 |
| 74.5 | ≤ 37.5 | 24.56 | 2.00 |
| 75.0 | ≤ 37.5 | 24.64 | 2.00 |
| 75.5 | ≤ 37.5 | 24.75 | 2.00 |
| 76.0 | ≤ 37.5 | 24.68 | 2.00 |
| 76.5 | ≤ 37.5 | 24.39 | 2.00 |
| 77.0 | ≤ 37.5 | 24.83 | 2.00 |
| 77.5 | ≤ 37.5 | 24.60 | 2.00 |
| 78.0 | ≤ 37.5 | 25.70 | 2.00 |
| 78.5 | ≤ 37.5 | 25.33 | 2.00 |
| 79.0 | ≤ 37.5 | 25.50 | 2.00 |
| 79.5 | ≤ 37.5 | 25.55 | 2.00 |
| 80.0 | ≤ 37.5 | 24.61 | 2.00 |
| 80.5 | ≤ 37.5 | 24.91 | 2.00 |

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Datum: 29.06.2016

Material Number 1089.0899.02 Serial Number 100062 Certificate Number 20-300391704

| | | | |
|------|--------|-------|------|
| 81.0 | ≤ 37.5 | 24.17 | 2.00 |
| 81.5 | ≤ 37.5 | 24.35 | 2.00 |
| 82.0 | ≤ 37.5 | 24.11 | 2.00 |
| 82.5 | ≤ 37.5 | 24.29 | 2.00 |
| 83.0 | ≤ 37.5 | 24.54 | 2.00 |
| 83.5 | ≤ 37.5 | 24.75 | 2.00 |
| 84.0 | ≤ 37.5 | 24.81 | 2.00 |
| 84.5 | ≤ 37.5 | 24.71 | 2.00 |
| 85.0 | ≤ 37.5 | 24.86 | 2.00 |
| 85.5 | ≤ 37.5 | 23.71 | 2.00 |
| 86.0 | ≤ 37.5 | 23.26 | 2.00 |
| 86.5 | ≤ 37.5 | 23.83 | 2.00 |
| 87.0 | ≤ 37.5 | 23.19 | 2.00 |
| 87.5 | ≤ 37.5 | 23.24 | 2.00 |
| 88.0 | ≤ 37.5 | 22.94 | 2.00 |
| 88.5 | ≤ 37.5 | 23.32 | 2.00 |
| 89.0 | ≤ 37.5 | 22.13 | 2.00 |
| 89.5 | ≤ 37.5 | 22.11 | 2.00 |
| 90.0 | ≤ 37.5 | 21.64 | 2.00 |

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1. Überprüfung der Ergebnisse:

Hiermit wird bestätigt dass die Ergebnisse, die in dem vorliegenden externen Kalibrierschein geliefert wurden, vollständig und plausibel sind. Des Weiteren wird bestätigt dass die Ergebnisse auf national oder international anerkannte Normale rückgeführt sind und die Anforderungen der ISO/IEC 17025 erfüllt sind.

Für Eingangsprüfung
zuständiger Mitarbeiter

Überprüft von

Für das Kalibrierlabel
zuständiger Mitarbeiter



Ralf Trepper



Manfried Dudde



Ralf Grabowski

ENDE