R&S® SMBV-Z1
Reference Frequency Converter
Specifications
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Definitions

General
Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 30 minutes warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to
- All internal automatic adjustments performed, if applicable
- Level within specified level range

Specifications with limits
Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as <, ≤, >, ≥, or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.

Specifications without limits
Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value (e.g. dimensions or resolution of a setting parameter). Compliance is ensured by design.

Typical data (typ.)
Characterizes product performance by means of representative information for the given parameter. When marked with <, > or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

Nominal values (nom.)
Characterize product performance by means of a representative value for the given parameter (e.g. nominal impedance). In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

Measured values (meas.)
Characterize expected product performance by means of measurement results gained from individual samples.

Uncertainties
Represent limits of measurement uncertainty for a given measurand. Uncertainty is defined with a coverage factor of 2 and has been calculated in line with the rules of the Guide to the Expression of Uncertainty in Measurement (GUM), taking into account environmental conditions, aging, wear and tear.

Typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.
Introduction
The R&S®SMBV-Z1 reference frequency converter allows a wide range of Rohde & Schwarz signal generators to be synchronized to reference signals of various frequencies. When equipped with this converter, a Rohde & Schwarz signal generator can be referenced to a system’s reference signal, even if it is not directly supported by the signal generator’s reference input.

The R&S®SMBV-Z1 reference frequency converter outputs a 10 MHz signal that is phase-locked to the converter’s input signal. A narrow phase-lock bandwidth ensures that excessive noise has minimum influence on the input signal so that the signal generator’s phase noise performance is maintained. The output of the R&S®SMBV-Z1 should be connected directly to the reference input of the signal generator.

Specifications

Input signal

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input frequency range</td>
<td>1 MHz to 100 MHz</td>
</tr>
<tr>
<td>Permissible input frequencies</td>
<td>M = 2 to 65, N = 2 to 65</td>
</tr>
<tr>
<td>Input frequency accuracy</td>
<td>( &lt; 2 \times 10^{-7} )</td>
</tr>
<tr>
<td>Input level</td>
<td>10 dBm to 16 dBm</td>
</tr>
<tr>
<td>Input impedance</td>
<td>50 ( \Omega ) (nom.)</td>
</tr>
</tbody>
</table>

Output signal

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output frequency</td>
<td>referenced to input signal</td>
</tr>
<tr>
<td>Output level</td>
<td>13 dBm (nom.)</td>
</tr>
<tr>
<td>Internal PLL bandwidth</td>
<td>for 10 MHz/N = 20 kHz</td>
</tr>
<tr>
<td>Setting time</td>
<td>for 10 MHz/N = 20 kHz</td>
</tr>
</tbody>
</table>

Spectral purity

Measured phase noise of 10 MHz output signal.
## Connectors

<table>
<thead>
<tr>
<th>Front panel connectors</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>REF OUT</td>
<td>10 MHz output</td>
<td>BNC female</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rear panel connectors</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>REF IN</td>
<td>reference frequency input</td>
<td>BNC female</td>
</tr>
</tbody>
</table>

## General data

### Power supply

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>DC input voltage</td>
<td>12 V</td>
<td></td>
</tr>
<tr>
<td>Max. input current</td>
<td>0.6 A (nom.)</td>
<td></td>
</tr>
<tr>
<td>Power consumption</td>
<td>after warm-up</td>
<td>2.1 W (meas.)</td>
</tr>
</tbody>
</table>

### EMC

Electromagnetic compatibility:

- in line with EU EMC Directive 2004/108/EC
- applied harmonized standards:
  - EN 61326-1 (industrial environment)
  - EN 61326-2-1
  - EN 55011 (class A)
  - EN 61000-3-2
  - EN 61000-3-3

### Environmental conditions

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Temperature range</td>
<td>operating</td>
<td>0 °C to +55 °C</td>
</tr>
<tr>
<td></td>
<td>storage</td>
<td>−20 °C to +70 °C</td>
</tr>
</tbody>
</table>

### Dimensions and weight

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions W × H × D</td>
<td>102 mm × 37 mm × 175 mm</td>
<td>(4.02 in × 1.46 in × 6.89 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>0.95 kg (2.09 lb)</td>
<td></td>
</tr>
</tbody>
</table>

### Calibration interval

Recommended calibration interval:

- operation 40 h/week within the specified temperature ranges
- 3 years

## Ordering information

<table>
<thead>
<tr>
<th>Designation</th>
<th>Type</th>
<th>Order No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference Frequency Converter  (including power supply, operating manual and service manual)</td>
<td>R&amp;S®SMBV-Z1</td>
<td>1418.8003.02</td>
</tr>
</tbody>
</table>
About Rohde & Schwarz
Rohde & Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established more than 75 years ago, Rohde & Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

Environmental commitment
- Energy-efficient products
- Continuous improvement in environmental sustainability
- ISO 14001-certified environmental management system

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