

U1831C USB Noise Source

10 MHz to 26.5 GHz

Noise Source Designed to Meet Specific Needs

The Keysight Technologies Inc U1831C USB noise source is designed to work with:

- X-series signal analyzers
- NFA'B series of noise figure analyzers
- M9391/3A PXIe VSA

For noise figure measurement application covering both bench-top and modular solution.



The USB connectivity that comes with smart features of automatically download of electronically stored calibration data and temperature sensing. To simplify measurement set-up and improve accuracy this noise source automatically downloads electronically stored calibration data to the compatible Keysight noise figure measuring analyzers. The noise sources also have the capability to automatically measure their own temperature so that compensation can be applied to the calibration data. These capabilities increase the overall reliability and accuracy of noise figure measurements.



U1831C key features and benefits

- Automatic download of ENR data to the analyzers significantly speeds up the overall setup time
- Electronic storage of Excess Noise Ratio (ENR) calibration data decreases opportunity for user error
- Temperature sensing improves measurement accuracy, leading to tighter specification of device performance

The U1831C covers an operating frequency from 10 MHz to 26.5 GHz and comes with 3.5 mm (male) RF connector where it provides a DC drive through USB connectivity.



Figure 1. Automatic detection of U1831C smart noise source with N9030A PXA signal analyzer.

Cal Table
 Noise Source ID: U1831C
 Noise Source Serial: MY58100004

Frequency	ENR Value
10.000000 MHz	14.64 dB
100.000000 MHz	14.45 dB
1.00000000 GHz	14.14 dB
2.00000000 GHz	14.07 dB
3.00000000 GHz	13.93 dB
4.00000000 GHz	13.92 dB
5.00000000 GHz	14.00 dB
6.00000000 GHz	14.00 dB
7.00000000 GHz	14.10 dB
8.00000000 GHz	14.18 dB
9.00000000 GHz	14.55 dB
10.00000000 GHz	14.73 dB
11.00000000 GHz	14.75 dB
12.00000000 GHz	14.80 dB
13.00000000 GHz	14.80 dB
14.00000000 GHz	14.76 dB
15.00000000 GHz	14.61 dB
16.00000000 GHz	14.45 dB
17.00000000 GHz	14.14 dB
18.00000000 GHz	14.00 dB
19.00000000 GHz	14.02 dB
20.00000000 GHz	14.14 dB
21.00000000 GHz	14.40 dB
22.00000000 GHz	14.65 dB
23.00000000 GHz	14.88 dB
24.00000000 GHz	15.00 dB

Figure 2. Automatic uploading of ENR value of U1831C smart noise source with N9030A PXA signal analyzer.

U1831C for accurate and reliable noise figure measurement of a device up to 26.5 GHz

The U1831C USB smart noise source was designed to measure DUT noise figures reliably and accurately up to 30 dB from 10 MHz up to 26.5 GHz. It serves as an ideal usage for general purpose use with low reflection coefficient and a nominal ENR value of 15 dB.

Accurate Noise Power

The output of a noise source, usually given in terms of Excess Noise Ratio (ENR), must be known in order to make accurate noise figure measurements. Any uncertainty in the ENR transfers into uncertainty of the measured noise figure, dB for dB. Keysight provides accurate ENR calibration data with each noise source. ENR uncertainty and reflection coefficients at each frequency point are provided as well.

The following example is an example of calibration data for an U1831C USB smart noise source.

```
[Filetype ENR]
[Version 1.0]
[Serialnumber MY58100004]
[Model U1831C]
[Caldate 20180330]
[Temperature 23]
[Current 3018]
[Humidity 70%]
! Frequency ENR   Unc Refl.Coef.On  Refl.Coef.Off
!   Hz   dB   dB   Mag Phase Deg  Mag Phase Deg

10000000,14.639,0.124,0.051,-135.76,0.064,-19.5,0,0,0,0
100000000,14.447,0.115,0.04,171.1,0.059,-16.62,0,0,0,0
1000000000,14.135,0.112,0.039,50.74,0.057,-154.31,0,0,0,0
2000000000,14.072,0.134,0.037,-76.38,0.052,55.46,0,0,0,0
3000000000,13.929,0.125,0.038,155.39,0.046,-90.01,0,0,0,0
4000000000,13.92,0.105,0.039,30.12,0.044,127.55,0,0,0,0
5000000000,13.997,0.145,0.04,-97.36,0.042,-10.94,0,0,0,0
6000000000,13.999,0.126,0.046,140.09,0.046,-152.38,0,0,0,0
```

Specifications

Specifications refer to the performance standards or limits against which the U1831C USB noise source is tested. These specifications for the noise are **ONLY** valid if the analyzers have been allowed to meet its specified warm up time of 60 minutes.

Typical characteristics are included for additional information only and they are not warranted specifications. Those denoted as “typical”, “nominal” or “approximate” are printed in *italic*.

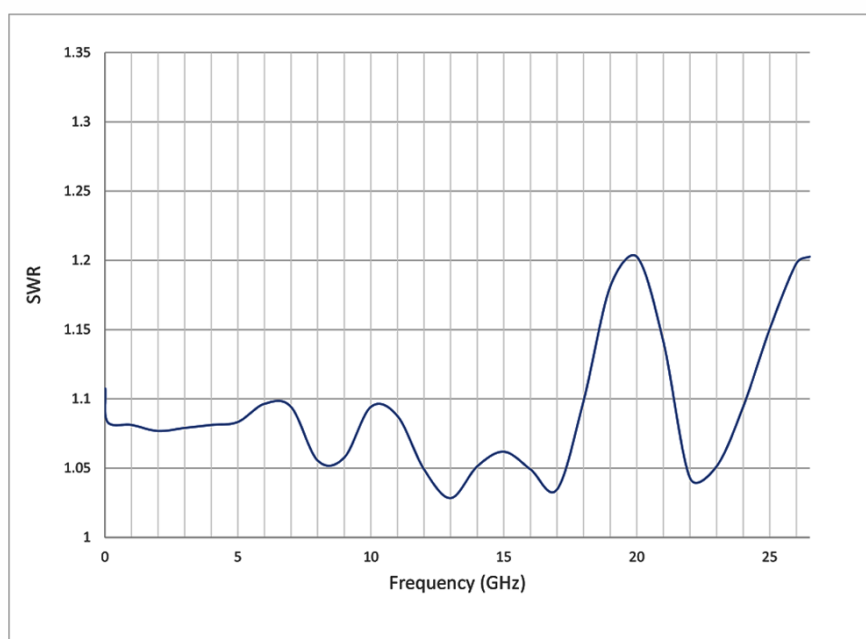


Figure 3. Characteristic SWR at 23 °C.

Specifications are subject to change.

Specifications	
Frequency range	10 MHz to 26.5 GHz
ENR range	12 to 17 dB
<i>ENR variation with temperature</i>	<i>< 0.01 dB/°C for 30 MHz to 26.5 GHz</i>
<i>ENR uncertainties (± dB) ¹</i>	<i>0.01 to 1.5 GHz: 0.15</i>
	<i>1.5 to 7 GHz: 0.13</i>
	<i>7 to 18 GHz: 0.15</i>
	<i>18 to 26.5 GHz: 0.22</i>
VSWR (max)	0.01 to 7 GHz: < 1.22
	7 to 18 GHz: < 1.25
	18 to 26.5 GHz: < 1.35
Reflection coefficient (Rho)(p)	0.01 to 7 GHz: 0.10
	7 to 18 GHz: 0.11
	18 to 26.5 GHz: 0.15

1. Characteristics values are met or bettered by 90% of instruments with 90% confidence.

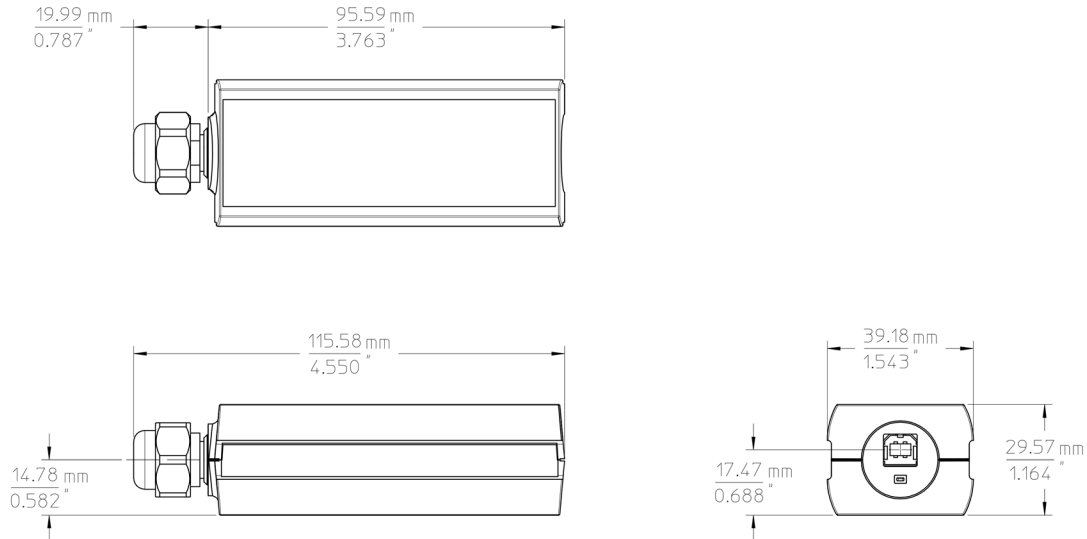
Supplemental Characteristic

Supplemental characteristics are not specifications but are typical characteristics included as additional information for the user.

Supplemental characteristics	
Calibration data (ENR) storage	EEPROM
Automatically download ENR data to analyzers	Yes
Automatic temperature sensing	Yes
USB requirement	5 V nominal, 500 mA maximum
Maximum reverse power	1 W
Input connector	3.5 mm (male)

Temperature sensing accuracy	
Range	0 to 55 °C
Resolution	0.25 °C
Accuracy	± 1 °C at 25 °C
	± 2 °C over 0 to 55 °C
Environmental specifications	
Temperature range	
Operating	0 to 55 °C
Storage	-40 to +70 °C
Relative humidity	
Operating	95% RH at 40 °C (non-condensing)
Mechanical shock	
End-use handling shock	Delta V: 1.6 m/s (60 in/s) ± 5%, Duration < 3 ms
Transportation shock	50 G, Delta V: 8m/s ± 10%
Vibration	
Operating random vibration	0.21 Grms
Survival random vibration	2.09 Grms
Altitude	
Operating	< 4572 meters (15000 feet)
ESD immunity	
Contact discharge	4 kV per IEC 61000-4-2
Air discharge	8 kV per IEC 61000-4-2

Mechanical Dimension ¹



1. Dimensions are in mm (inches) nominal unless otherwise specified.

Ordering Information

	Description
U1831C	10 MHz to 26.5 GHz (15 dB ENR) USB noise source
USB cable options	
Option 101	1.8 meter USB cable
Option 102	3 meter USB cable
Compatible noise figure analyzers	
N8973/4/5/6B	Noise figure analyzers www.keysight.com/find/NFA
Compatible signal analyzers	
N9040/1B	UXA signal analyzer www.keysight.com/find/uxa
N9030A/B	PXA signal analyzer www.keysight.com/find/pxa
N9020A/B	MXA signal analyzer www.keysight.com/find/mxa
N9010A/B	EXA signal analyzer www.keysight.com/find/exa
N9000A/B	CXA signal analyzer www.keysight.com/find/cxa
Compatible PXI modular analyzers	
M9391A/3A	M9391A/3A PXIe vector signal analyzers www.keysight.com/find/PXI

For more selection of Keysight's noise sources, go to:

www.keysight.com/find/noisesources

For more selection of other Keysight's RF and microwave test accessories, go to:

www.keysight.com/find/mta

Learn more at: www.keysight.com

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at:

www.keysight.com/find/contactus

