

USB Smart Noise Sources

U1832A: 10 MHz to 18 GHz, 5 dB ENR nominal

U1832B: 10 MHz to 26.5 GHz, 5 dB ENR nominal

U1833A: 10 MHz to 18 GHz, 15 dB ENR nominal

U1833B: 10 MHz to 26.5 GHz, 15 dB ENR nominal

U1832C: 500 MHz to 50 GHz, 5 dB ENR nominal

U1833C: 500 MHz to 50 GHz, 15 dB ENR nominal

U1833D: 500 MHz to 60 GHz, 10 dB ENR nominal

U1833G: 500 MHz to 67 GHz, 12 dB ENR nominal

U1833M: 2 to 100 GHz



Noise Sources Designed to Meet Specific Needs

Keysight Technologies USB smart noise sources works in conjunction with

- NFA series noise figure analyzers
- X-series signal analyzers
- Vector network analyzers
- FieldFox (does not support U1833G)

The USB (USB-TMC compliant) 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.

USB Smart Noise Sources Key Features

- 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

U1832/3x for Accurate And Reliable Noise Figure Measurement of a Device Up to 100 Ghz

The U183x USB smart noise source was designed to measure DUT noise figures reliably and accurately up to 30 dB from 10 MHz up to 100 GHz. It serves as an ideal usage for general purpose use with low reflection coefficient and a nominal ENR value of 5/10/12/15 dB.. The U1833M is usable up to 106 GHz.

Accurate Noise Power

The output of a noise source, usually given in terms of Excess Noise Ratio (ENR), must be known 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.

Specifications

Specifications refer to the performance standards or limits against which the U1832/3x USB smart noise sources are tested. These specifications for the noise sources are ONLY valid if the analyzers have been allowed to meet its specified warm up time. Typical characteristics are included for additional information only and they are not warranted specifications.

| Parameter | U1832A | U1832B | U1833A | U1833B |
|--|--|---|--|--|
| Frequency range | 10 MHz to 18 GHz | 10 MHz to 26.5 GHz | 10 MHz to 18 GHz | 10 MHz to 26.5 GHz |
| ENR range | 4.5 to 6.5 dB | 4 to 7 dB | 14 to 16 dB | 12 to 17 dB |
| Return Loss (VSWR) | 10 MHz to 2 GHz: > 30.46 (< 1.06) 2 to 3 GHz: > 24.44 (< 1.13) 3 to 7 GHz: > 24.44 (< 1.13) 7 to 18 GHz: > 20.00 (< 1.22) | 10 MHz to 2 GHz: > 30.46 (< 1.06) 2 to 3 GHz: > 30.46 (< 1.06) 3 to 7 GHz: > 24.44 (< 1.13) 7 to 18 GHz: > 20.00 (< 1.22) 18 to 26.5 GHz: > 19.17 (< 1.25) | 10 MHz to 2 GHz: > 23.10 (< 1.15) 2 to 3 GHz: > 23.10 (< 1.15) 3 to 7 GHz: > 20.92 (< 1.20) 7 to 18 GHz: > 19.17 (< 1.25) | 10MHz to 2 GHz: > 20.00 (< 1.22) 2 to 3 GHz: > 20.00 (< 1.22) 3 to 7 GHz: > 20.00 (< 1.22) 7 to 18 GHz: > 19.17 (< 1.25) 18 to 26.5 GHz: > 16.48 (< 1.35) |
| Reflection coefficient (Rho) | 10 MHz to 2 GHz: < 0.03 2 to 3 GHz: < 0.06 3 to 7 GHz: < 0.06 7 to 18 GHz: < 0.10 | 10 MHz to 2 GHz: < 0.03 2 to 3 GHz: < 0.03 3 to 7 GHz: < 0.06 7 to 18 GHz: < 0.10 18 to 26.5 GHz: < 0.11 | 10 MHz to 2 GHz: < 0.07 2 to 3 GHz: < 0.07 3 to 7 GHz: < 0.09 7 to 18 GHz: < 0.11 | 10 MHz to 2 GHz: < 0.10 2 to 3 GHz: < 0.10 3 to 7 GHz: < 0.10 7 to 18 GHz: < 0.11 18 to 26.5 GHz: < 0.15 |
| Reflection coefficient (Rho) delta (typical) | < 0.01 | < 0.015 | < 0.1 | < 0.15 |
| Connector | N-Type (m) | 3.5 mm (m) | N-Type (m) | 3.5 mm (m) |

| Parameter | U1832C | U1833C | U1833D | U1833G |
|--------------------|--|---|--|--|
| Frequency range | 500 MHz to 50 GHz: | 500 MHz to 50 GHz: | 500 MHz to 60 GHz: | 500 MHz to 67 GHz |
| ENR range | 3.5 to 8.5 dB | 10 to 21 dB | 6 to 21 dB | 5 to 21 dB |
| Return Loss (VSWR) | 500MHz to 20 GHz: > 23.10 (< 1.15) 20 to 26.5 GHz: > 20.00 (< 1.22) 26.5 to 40 GHz: > 19.17 (< 1.25) 40 to 50 GHz: > 16.48 (< 1.35) | 500 MHz to 20 GHz: > 16.48 (< 1.35) 20 to 26.5 GHz: > 15.39 (< 1.41) 26.5 to 40 GHz: > 13.98 (< 1.50) 40 to 50 GHz: > 13.98 (< 1.50) | 500 MHz to 20 GHz: > 16.48 (< 1.35) 20 to 26.5 GHz: > 15.39 (< 1.41) 26.5 to 40 GHz: > 13.98 (< 1.50) 40 to 50 GHz: > 13.98 (< 1.50) 50 to 60 GHz: > 13.98 (< 1.50) | 500 MHz to 18 GHz: > 17.72 (< 1.30) 18 to 26.5 GHz: > 15.39 (< 1.41) 26.5 to 40GHz: > 13.15 (< 1.56) 40 to 50 GHz: > 12.04 (< 1.67) 50 to 60GHz: > 10.17 (< 1.90) 60 to 67GHz: > 7.33 (< 2.51) |

| | | | | |
|--|---|---|---|---|
| Reflection coefficient (Rho) | 500 MHz to 20 GHz: 0.07 20 to 26.5 GHz: 0.10 26.5 to 40 GHz: 0.11 40 to 50 GHz: 0.15 | 500 MHz to 20 GHz: 0.15 20 to 26.5 GHz: 0.17 26.5 to 40 GHz: 0.20 40 to 50 GHz: 0.20 | 500 MHz to 20 GHz: 0.15 20 to 26.5 GHz: 0.17 26.5 to 40 GHz: 0.20 40 to 50 GHz: 0.20 50 to 60 GHz: 0.20 | 500 MHz to 18 GHz: 0.13 18 to 26.5 GHz: 0.17 26.5 to 40 GHz: 0.22 40 to 50 GHz: 0.25 50 to 60 GHz: 0.31 60 to 67 GHz: 0.43 |
| Reflection coefficient (Rho) delta (typical) | < 0.015 | < 0.15 | < 0.15 | < 0.15 |
| Connector | 2.4 mm (m) | 2.4 mm (m) | 1.85 mm (m) | 1.85 mm (m) |

| Parameter | U1833M |
|--|--|
| Frequency range | 2 GHz to 100 GHz: |
| ENR range | 2 to 100GHz: 5 to 25 dB |
| Return Loss (VSWR) | 2 to 40 GHz: > 9.90dB (< 1.94) 40 to 64 GHz: > 5.51dB (< 3.26) 64 to 100 GHz: > 1.01dB (< 17.18) |
| Reflection coefficient (Rho) | 2 to 40 GHz: < 0.32 40 to 64 GHz: < 0.53 64 to 100 GHz: < 0.89 |
| Reflection coefficient (Rho) delta (typical) | < 0.40 |
| Connector | 1.0 mm (m) |

Supplemental Characteristics

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

| Parameter | Model | Typical Specifications |
|--------------------------------|--------|---|
| ENR variation with temperature | U1832A | 30 MHz to 18 GHz: 0.013 dB/degC |
| | U1833A | 30 MHz to 18 GHz: 0.01 dB/degC |
| | U1832B | 30 MHz to 26.5 GHz: 0.01 dB/degC |
| | U1833B | 30 MHz to 26.5 GHz: 0.005 dB/degC |
| | U1832C | 500 MHz to 50 GHz: 0.015 dB/degC |
| | U1833C | 500 MHz to 50 GHz: 0.015 dB/degC |
| | U1833D | 500 MHz to 60 GHz: 0.015 dB/degC |
| | U1833G | 500 MHz to 67 GHz: 0.015 dB/degC |
| ENR uncertainties | U1833M | 2 to 85 GHz: 0.015 dB/degC 85 to 100 GHz: 0.03 dB/degC |
| | U1832A | +/- 0.13 dB |
| | U1833A | |
| | U1832B | |
| | U1833B | |

| | |
|--------|--|
| U1832C | 500 MHz to 26.5 GHz: +/- 0.20 dB 26.5 to 40 GHz: +/- 0.30 dB 40 to 50 GHz: +/- 0.45 dB |
| U1833C | 500 MHz to 26.5 GHz: +/- 0.13 dB 26.5 to 40 GHz: +/- 0.25 dB 40 to 50 GHz: +/- 0.35 dB |
| U1833D | 500 MHz to 26.5 GHz: +/- 0.13 dB 26.5 to 40 GHz: +/- 0.25 dB 40 to 50 GHz: +/- 0.35 dB 50 to 60 GHz: +/- 0.45 dB ¹ |
| U1833G | 500 MHz to 18GHz: +/- 0.16 dB 18 to 26.5 GHz: +/- 0.2 dB 26.5 to 40 GHz: +/- 0.31 dB 40 to 50 GHz: +/- 0.35 dB 50 to 67 GHz: +/- 0.5 dB ¹ |
| U1833M | 2 to 26 GHz: +/- 0.20 dB 26 to 49 GHz +/- 0.35 dB 49 to 65 GHz +/- 0.41 dB ¹ 65 to 100 GHz +/- 0.75 dB ¹ |

¹ Monte carlo error analysis, nominal, at 23°C ambient

Typical Performance

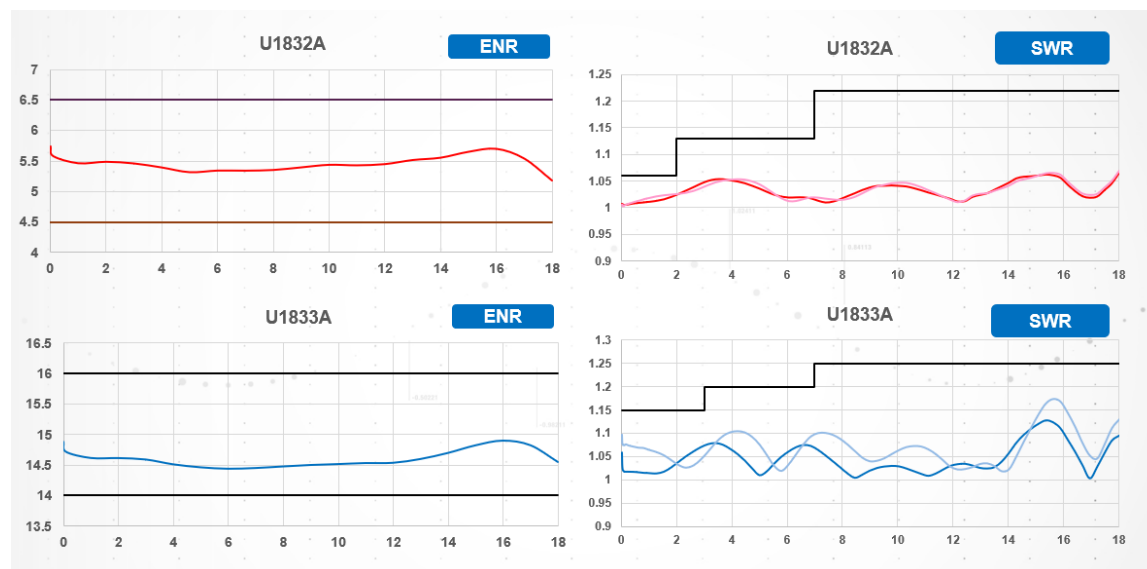


Figure 1. Typical ENR and return loss of U1832A and U1833A

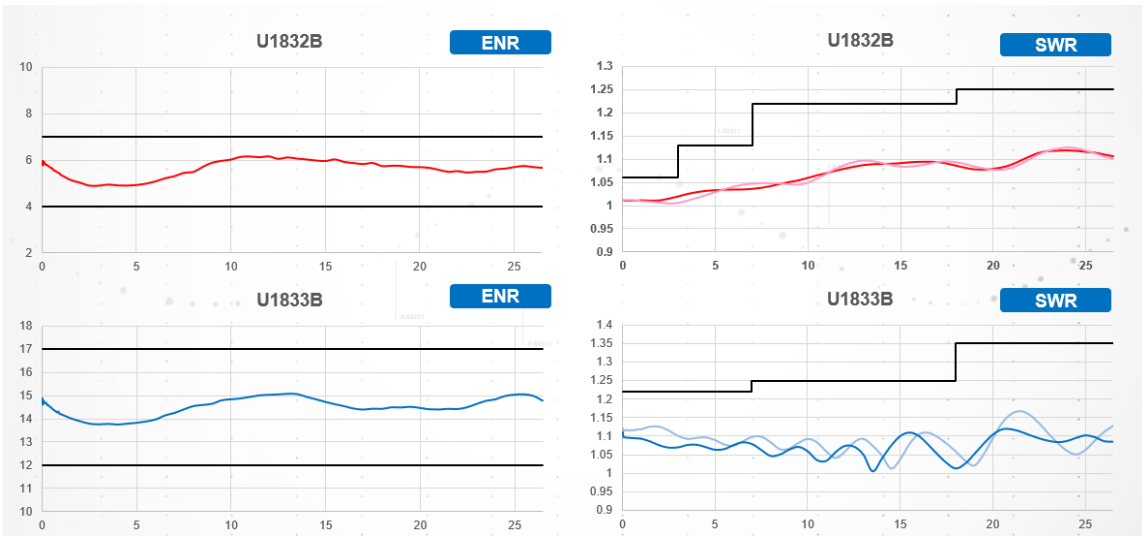


Figure 2. Typical ENR and return loss of U1832B and U1833B

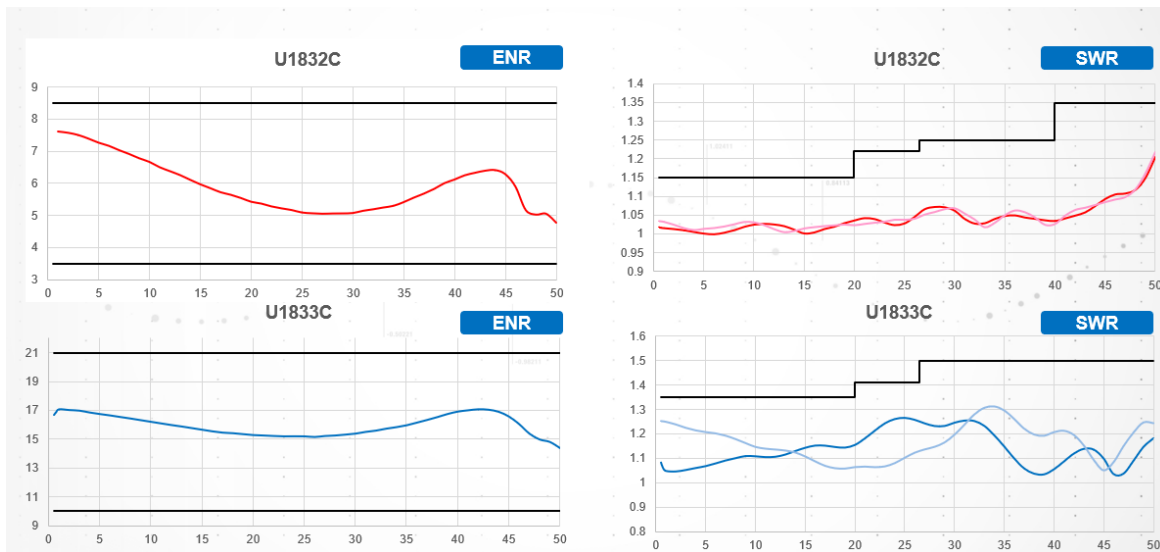


Figure 3. Typical ENR and return loss of U1832C and U1833C

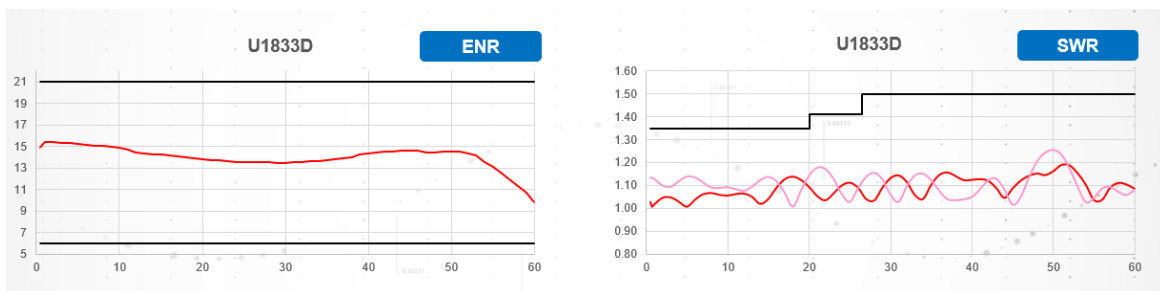


Figure 4. Typical ENR and return loss of U1833D

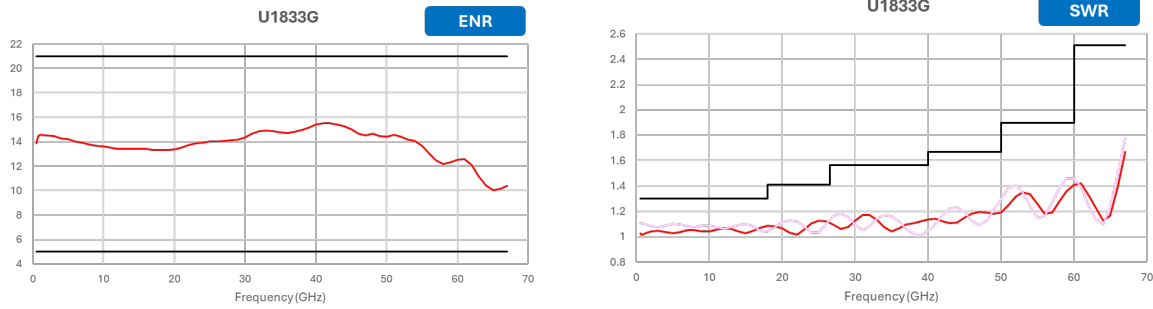


Figure 5. Typical ENR and return loss of U1833G

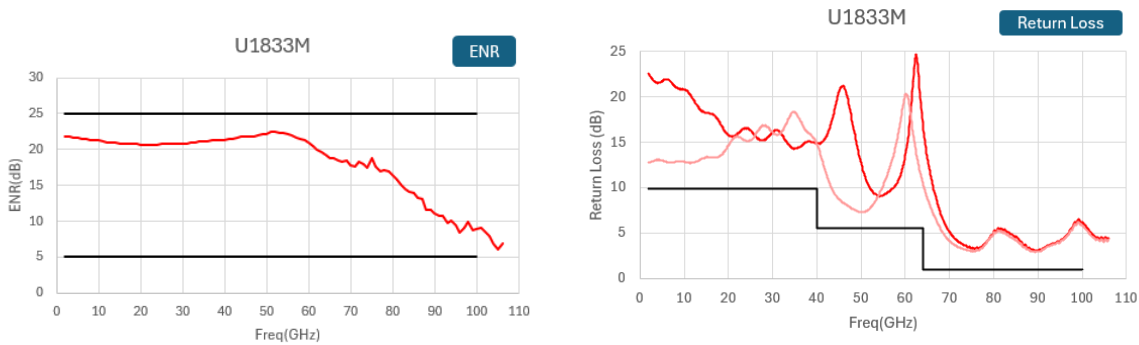


Figure 6. Typical ENR and return loss of U1833M

Environmental Specifications

Samples of this product have been type tested in accordance with the Keysight Environmental Test Manual and verified to be robust against the Environmental stresses of Storage, Transportation and End-use; those stresses include, but are not limited to, temperature, humidity, shock, vibration and altitude conditions. The primary source of Keysight Environmental Test standards is the International Electrotechnical Commission (IEC) standards.

| Parameter | |
|-------------|--|
| Temperature | Operating condition: 0 °C to 55 °C Storage condition: -40 °C to 70 °C |
| Humidity | Operating condition: Up to 95% RH at 40 °C (non-condensing) Method 1: 23°C/50% RH to 40°C/95% RH |
| Shock | End-use handling shock: ΔV : 1.6 m/s (60 in/s) $\pm 5\%$, duration Transportation shock: 50 g, ΔV : 8.56 m/s |
| Vibration | Operating Random Vibration: 5-500 Hz, 0.21 Grms Survival Swept Sine Vibration: 5 Hz-500 Hz-5 Hz, 0.75G Survival Random Vibration: 5-500 Hz, 2.41 Grms Packaging Drop: 48" drop height |

Altitude

Operating: 4,600 meters (15,092 feet)
Non-operating: 4,600 meters (15,092 feet)

ESD immunity

Contact discharge: 4 kV per IEC 61000-4-2
Air discharge: 8 kV per IEC 61000-4-2

Mechanical Dimensions

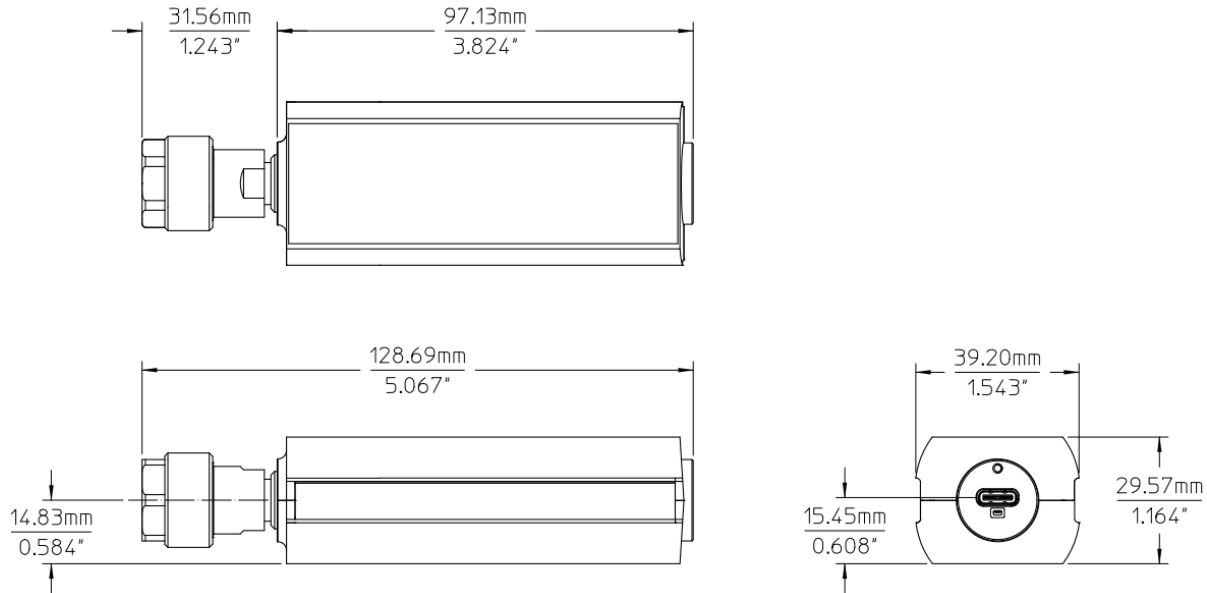


Figure 7. Mechanical dimension of U1832A

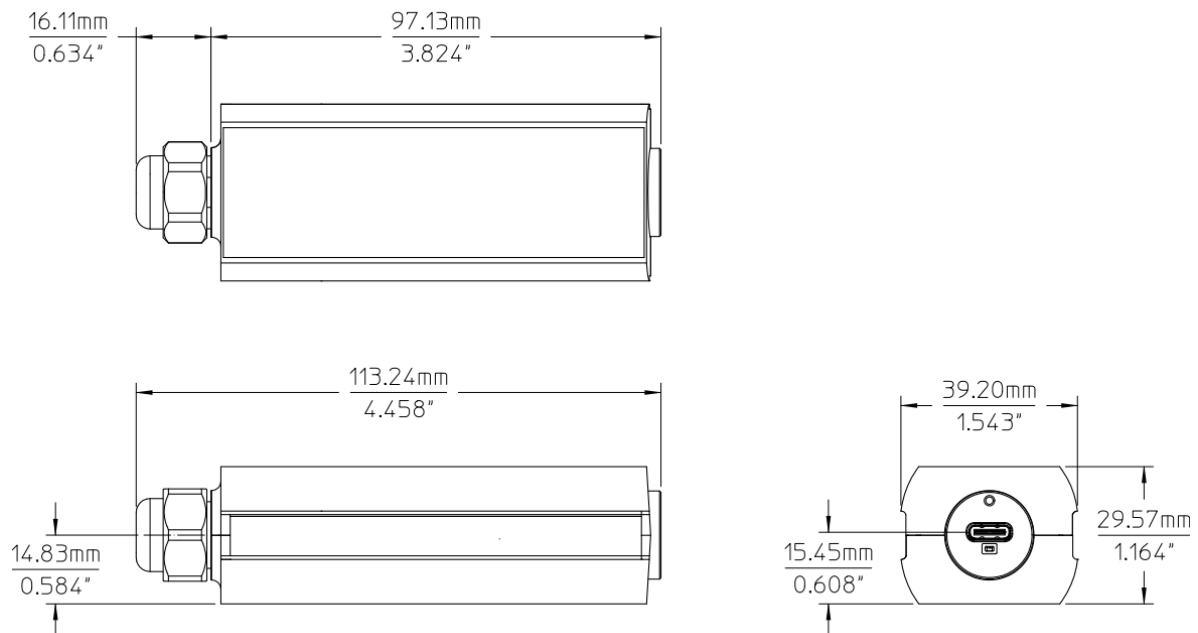


Figure 8. Mechanical dimension of U1832B

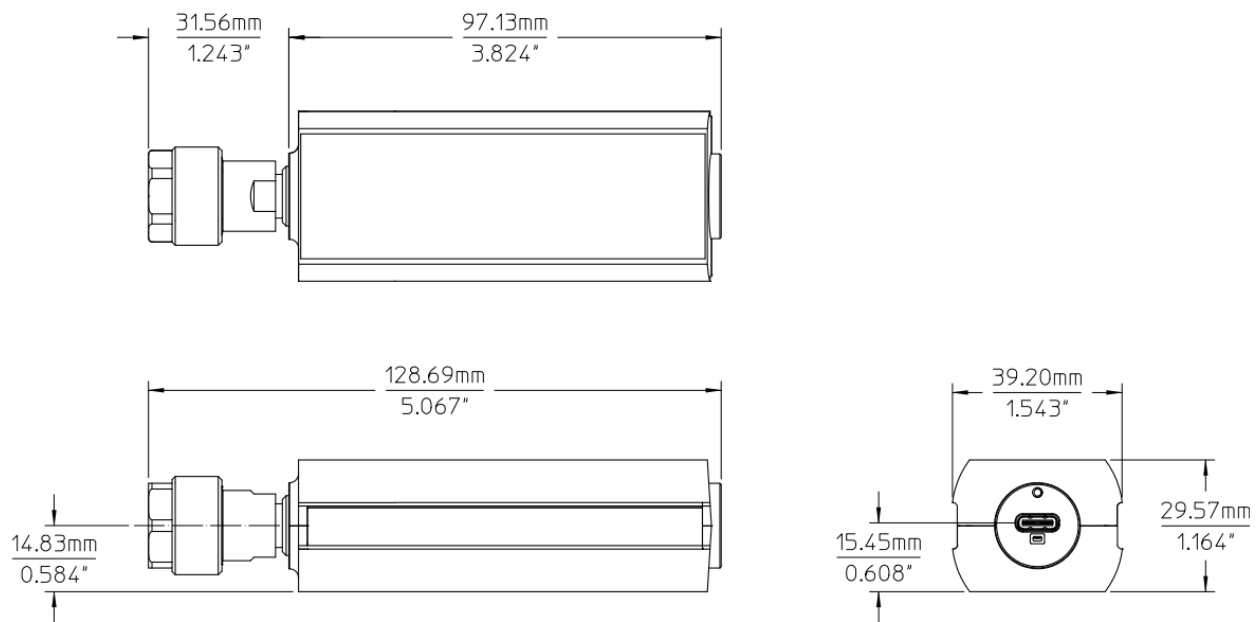


Figure 9. Mechanical dimension of U1833A

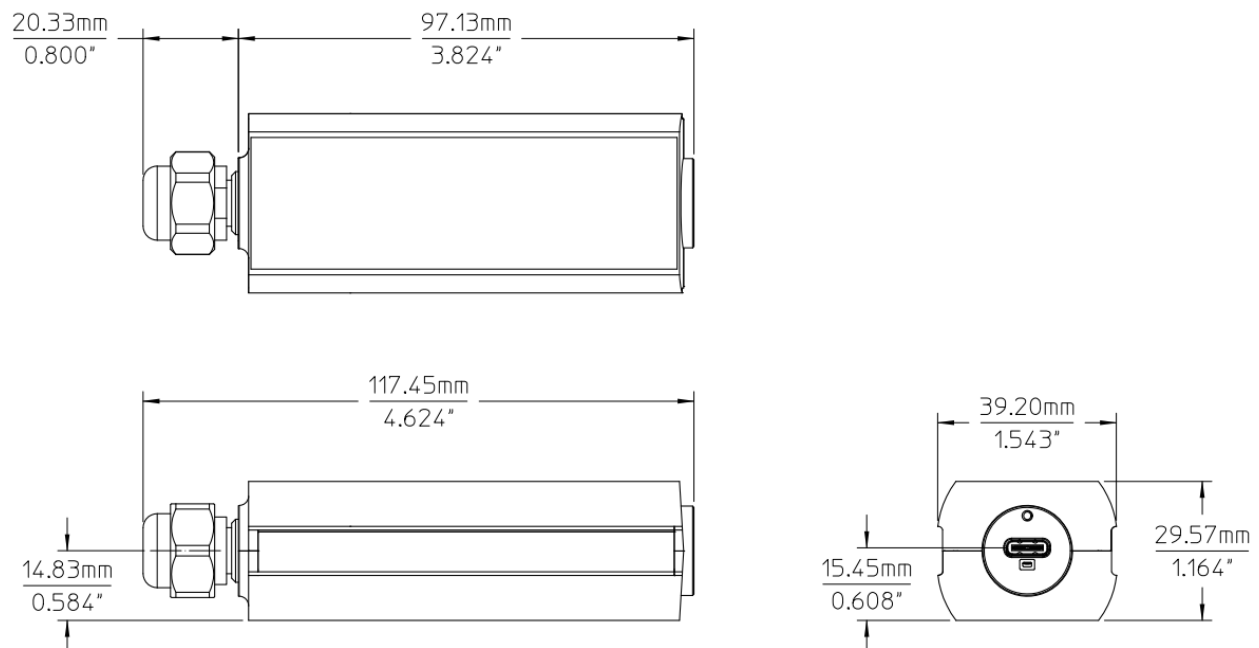


Figure 10. Mechanical dimension of U1833B

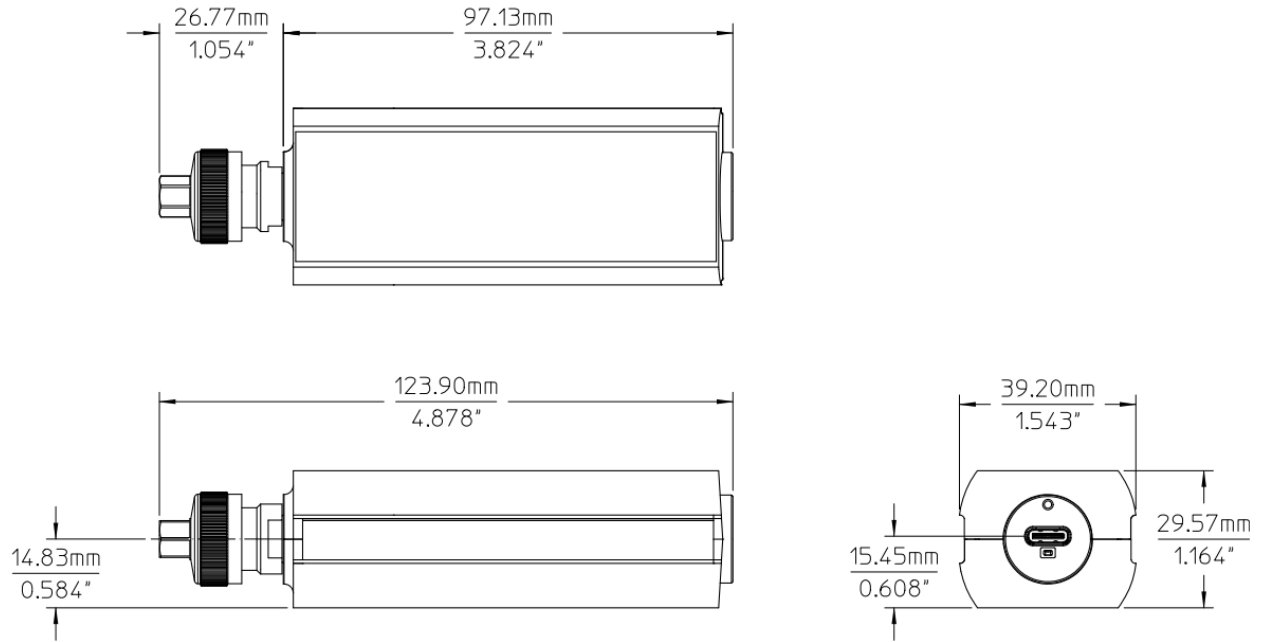


Figure 11. Mechanical dimension of U1832C

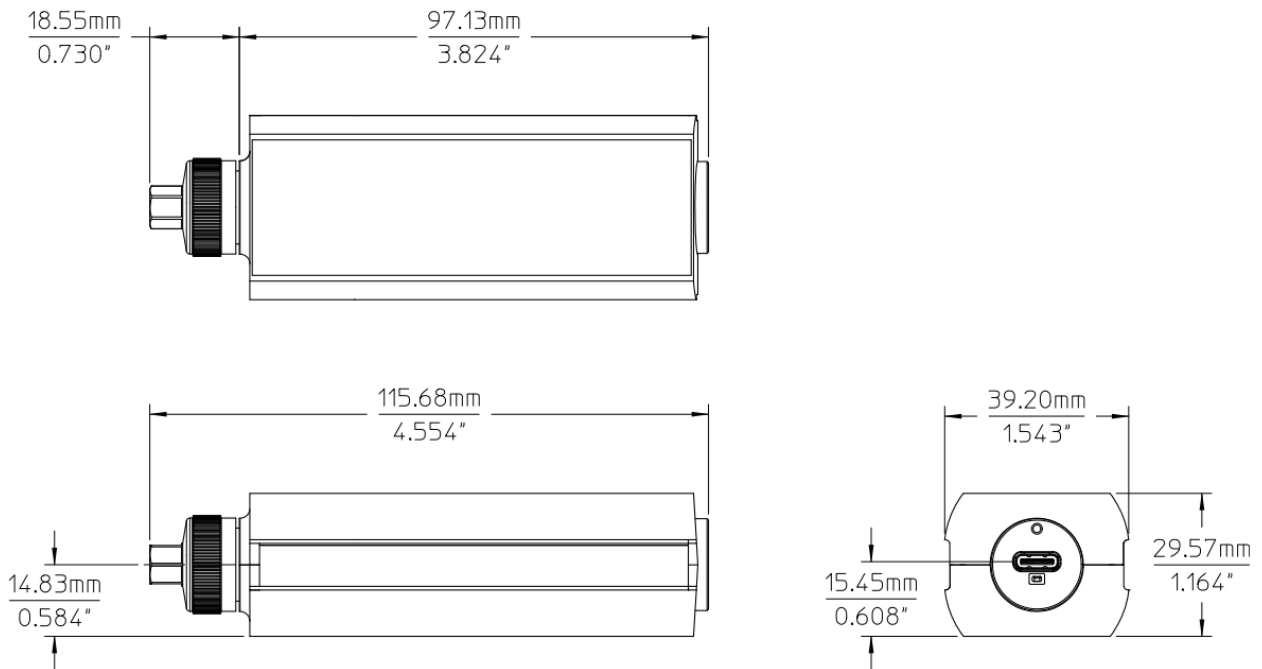


Figure 12. Mechanical dimension of U1833C

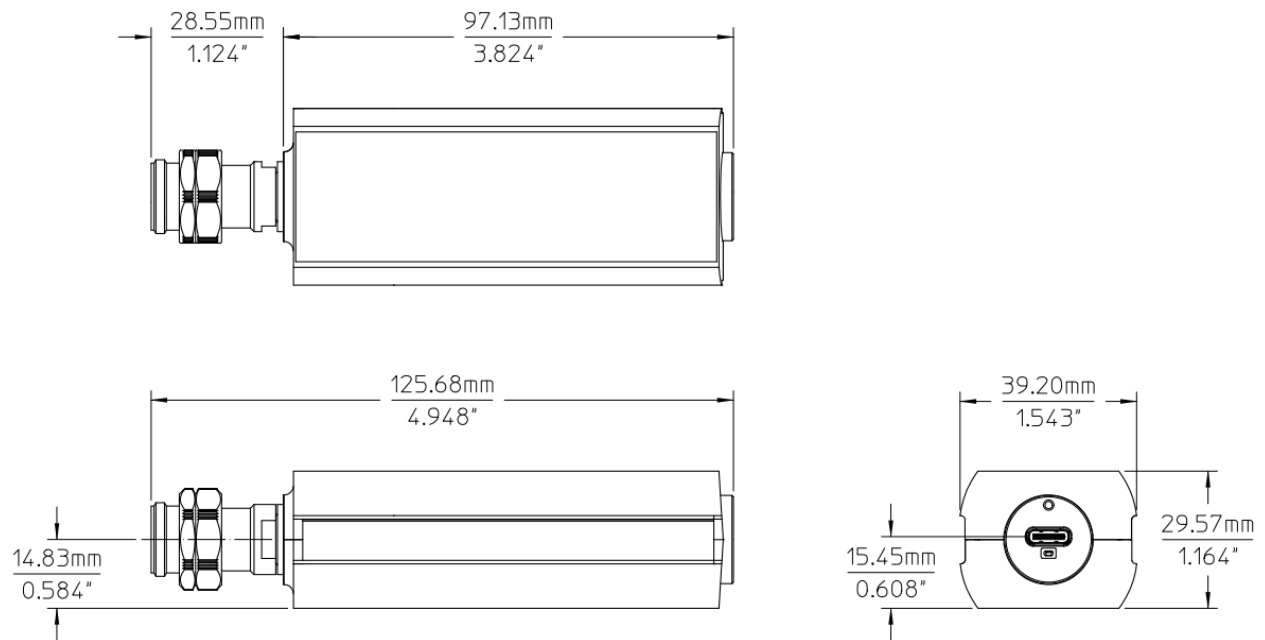


Figure 13. Mechanical dimension of U1833D

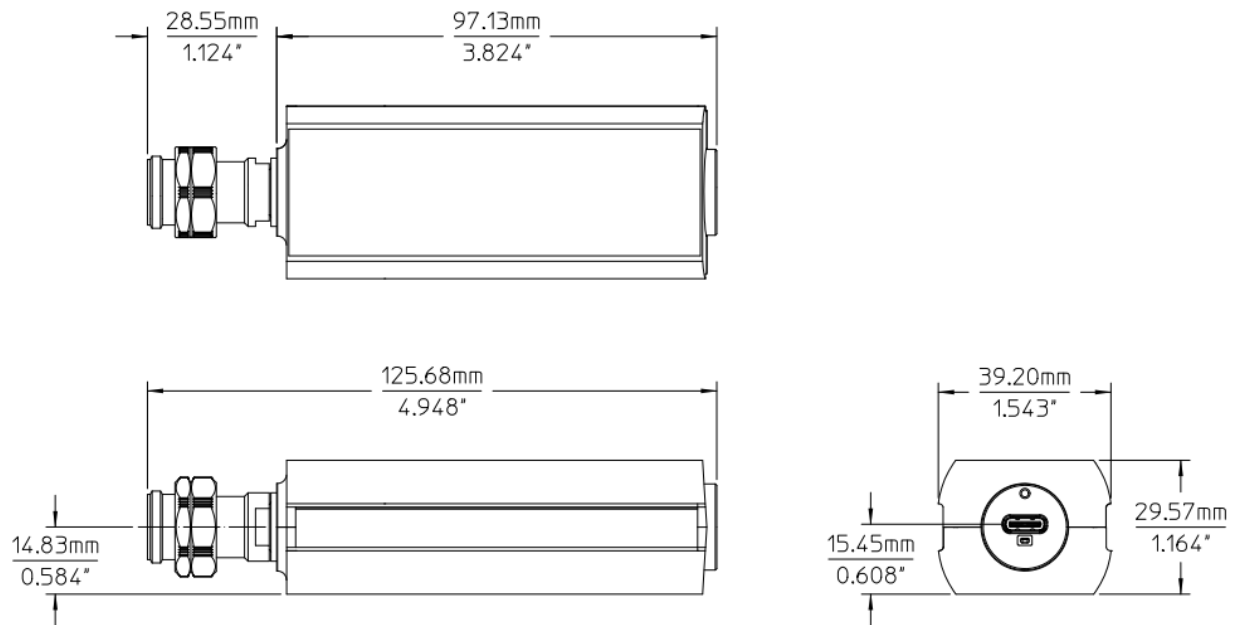


Figure 14. Mechanical dimension of U1833G

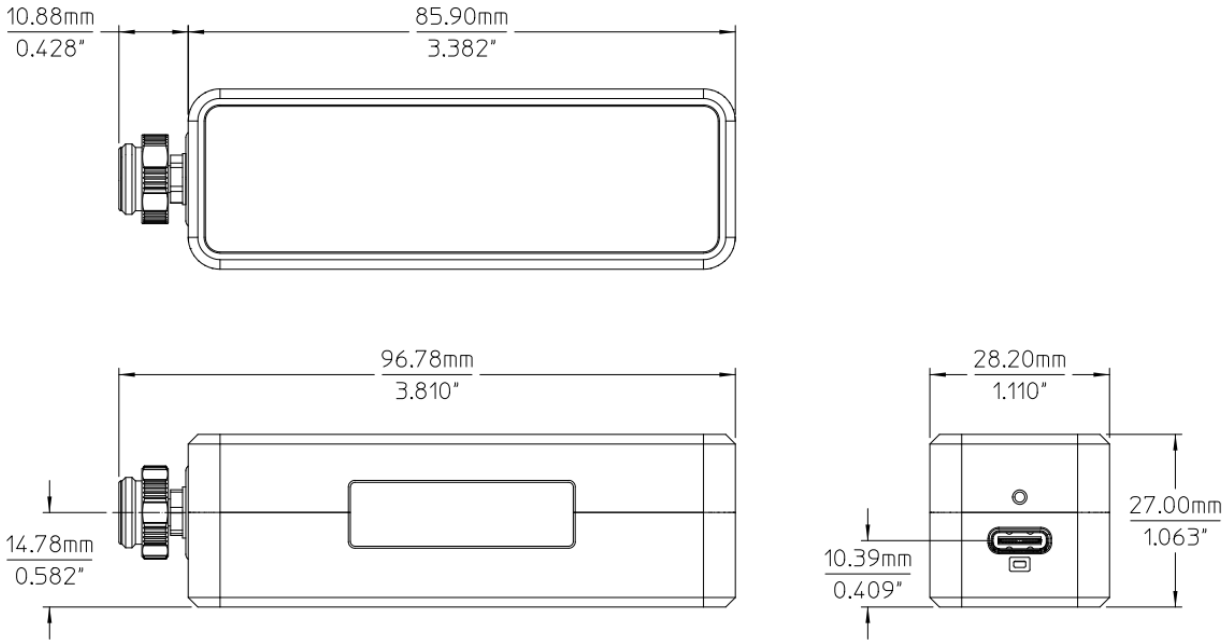


Figure 15. Mechanical dimension of U1833M

Ordering Information

| Model/Option | Description |
|--------------|---|
| U1832A | 10 MHz to 18 GHz, USB smart noise source, 5 dB ENR nominal |
| U1832B | 10 MHz to 26.5 GHz, USB smart noise source, 5 dB ENR nominal |
| U1832C | 500 MHz to 50 GHz, USB smart noise source, 5 dB ENR nominal |
| U1833A | 10 MHz to 18 GHz, USB smart noise source, 15 dB ENR nominal |
| U1833B | 10 MHz to 26.5 GHz, USB smart noise source, 15 dB ENR nominal |
| U1833C | 500 MHz to 50 GHz, USB smart noise source, 15 dB ENR nominal |
| U1833D | 500 MHz to 60 GHz, USB smart noise source, 10 dB ENR nominal |
| U1833G | 500 MHz to 67 GHz, USB smart noise source, 12 dB ENR nominal |
| U1833M | 2 to 100 GHz, USB smart noise source |
| Option 101 | USB 3.0 (Type C) cable, 1 meter |
| Option 102 | USB 3.0 (Type C) cable, 2 meters |

Keysight enables innovators to push the boundaries of engineering by quickly solving design, emulation, and test challenges to create the best product experiences. Start your innovation journey at www.keysight.com.