



# R&S®NGU411 versus Keithley 2401



## What sets this source measure unit apart?

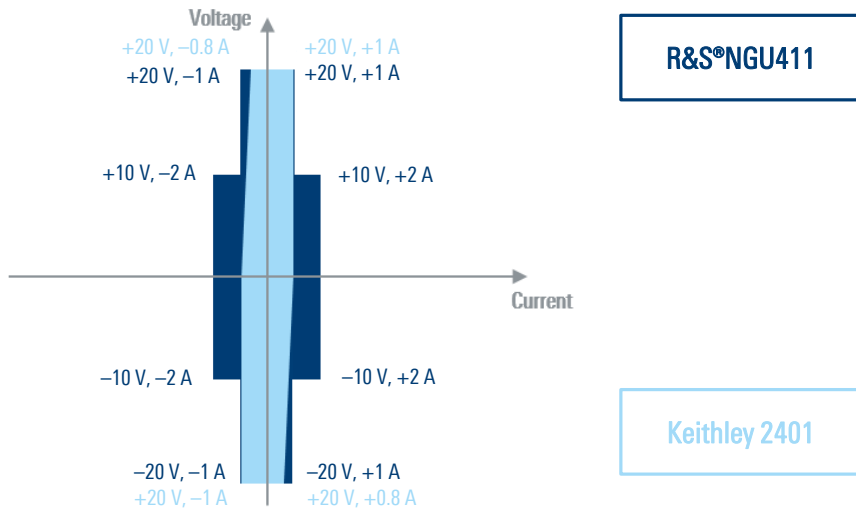
- ▶ Minimal residual ripple and noise to supply interference-free voltage to sensitive DUTs
- ▶ Fast regulation of output voltage with minimal overshoot and very fast load recovery time
- ▶ Acquisition rate of up to 500 ksamples/s to capture extremely fast variations in voltage and current
- ▶ Voltage priority and current priority mode
- ▶ High-capacitance mode
- ▶ Modulation input

Your benefit	Features
Minimal overshoot from abrupt load changes	<ul style="list-style-type: none"> <li>▶ Optimized load recovery time of &lt; 30 μs</li> <li>▶ Handles abrupt load changes from a few nA to the ampere range without creating voltage drops or overshoots</li> </ul>
Capture fast variations in voltage/current	<ul style="list-style-type: none"> <li>▶ Acquisition rate of up to 500 ksamples/s</li> <li>▶ Voltage and current results available every 2 μs</li> </ul>
Supply positive and negative voltages and currents	<ul style="list-style-type: none"> <li>▶ Four-quadrant operation allows the R&amp;S®NGU411 to act as a source or sink for both polarities. This enables tasks such as measuring the forward and reverse characteristics of semiconductor devices in a single test operation without having to make changes to the circuit.</li> </ul>
Can act as an AC source	<ul style="list-style-type: none"> <li>▶ The R&amp;S®NGU411 source measure unit provides a modulation input to connect e.g. an arbitrary generator. The output follows the modulation input signal, enabling the instrument to act as an AC source and be used to simulate glitches and unstable conditions.</li> </ul>

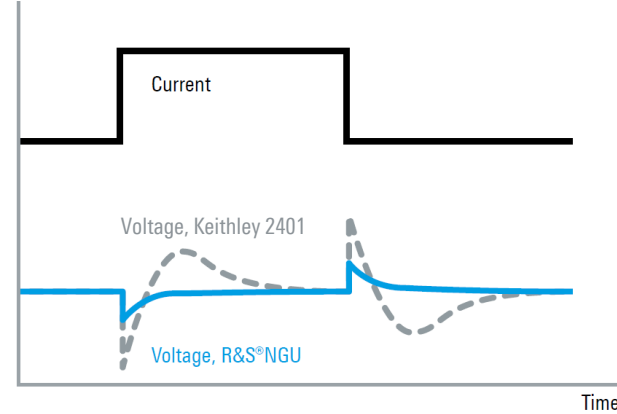
Parameter	R&S®NGU411	Keithley 2401
Max. voltage/current/power	±20 V/2 A/20 W	±20 V/1 A/20 W
Voltage ripple and noise (RMS)	< 500 μV (meas.)	not specified
Current ripple and noise (RMS)	< 1 mA (meas.)	not specified
Load recovery time	< 30 μs (meas.)	not specified
Rise time/fall time	< 100 μs / < 100 μs	not specified
Measurement functions	voltage, current, power, energy	voltage, current, resistance
Measured voltage/current ranges	2/5	3/7
Max. readback resolution	1 μV/100 pA	1 μV/10 pA
Max. voltage readback accuracy	< 0.025 % + 100 μV	< 0.012 % + 300 μV
Max. current readback accuracy	< 0.025 % + 15 nA	< 0.0295 % + 300 pA
Max. acquisition rate (min. step)	500 ksamples/s (2 μs)	1700 readings/s at 4 ½ digits
Arbitrary function (min. step)	QuickArb (100 μs)	test sequencer (500 μs)
Protective functions	OVP, OCP, OPP, OTP	OTP
Digital I/O	optional	yes
High-capacitance mode (maximum capacitance)	yes (470 μF)	no
Current priority mode	yes	no
Modulation input	yes	no



## Power envelope of the R&S®NGU411 versus Keithley 2401



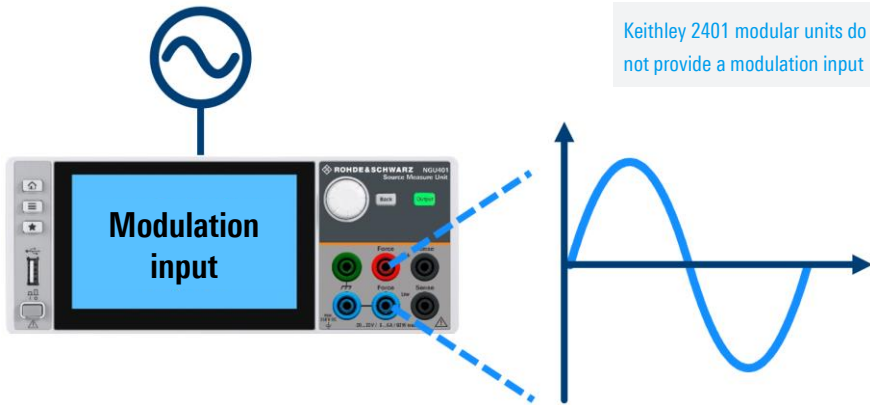
## Optimized load recovery time



Keithley 2401 modular units are slower than R&S®NGU source measure units

Under challenging load conditions, most power supplies respond with slow recovery times and overshoot. Specially developed circuits in the R&S®NGU source measure units achieve a load recovery time of  $< 30 \mu\text{s}$  with minimal overshoot, making them ideal for supplying sensitive components with power.

## Modulation input



The R&S®NGU411 source measure unit provides a modulation input to connect e.g. an arbitrary generator. The output follows the modulation input signal, enabling the instrument to act as an AC source and be used to simulate glitches and unstable conditions.

## Advantages of the R&S®NGU411 over the Keithley 2401

- QuickArb**  
2048 points per cycle
- Modulation input**
- EasyRamp**  
10 ms to 10 s
- Remote sensing**
- Lower noise**
- Sample/s**
- > 200 x faster acquisition time**