

System specifications

Reading

- Linear resistor measurement: 100 Ω to 100 M Ω with <10% error; 220 Ω to 10 M Ω < 5% error @ 0.5 V;
- Linear resistor reading acquisition time: 20 ms;
- Minimum current measurement: ± 1 nA (<5% error @ 0.5 V);
- Maximum current measurement: ± 5 mA (<5% error @ 0.5 V);
- Non-linear resistor maximum reading acquisition time: 700 μ s - 1 ms.

Writing

- Maximum pulse amplitude: ± 12 V;
- Voltage pulse resolution (0 - ± 1 V): 3 mV;
- Voltage pulse resolution (± 1 V - ± 12 V): 24 mV;
- Current cut-off range: 10 μ A - 1000 μ A;
- Minimum pulse width: 90 ns;
- Pulse width resolution: 10 ns;
- Maximum sourcing/sinking current: 50 mA;
- Minimum READ $\rightarrow$ WRITE interval: 120 μ s;
- Minimum WRITE $\rightarrow$ READ interval: 100 μ s;

Crossbar management

- Supports up to 32 $\times$ 32 crossbars;
- Four 2 $\times$ 8 headers support external connection;
- Four BNC connectors expose the active/inactive word and bit lines;
- A 68 pin PLCC slot allows packaged samples to be mounted and tested on-board;
- Active multi-port current redistribution scheme;
- V/2 and V/3 write scheme;

User Interface

- Python based - open source;
- Read Single, Read All or Read Stand Alone capabilities;
- Ability to select in between two read types;
- Color coded resistance map of DUT crossbar, updates after any operation;
- Click-to-pulse: apply single voltage pulse followed by a read operation;
- Real-time view of resistance evolution, along with the history of the pulsing operations performed;
- Pan, zoom and save publication-quality figures of the DUT history straight from the interface;
- Record the history of applied pulsing modules/single reads/single pulses in a separate history log;
- Expandable: new pulsing modules are added as separate python modules;