ArC TWO

Multi-Channel Characterisation Platform

Introduction

ArC TWO™ is the next generation multi-channel SMU from ArC Instruments for characterisation of semiconductor and memory devices. It offers **64 arbitrarily interconnectable channels** with current/voltage source and sink capabilities as well as **ultra-fast pulse generation** for unparalleled testing flexibility. Choose between a ready-to-run graphical interface with built-in device tests or develop your own applications using our low-level SDK and fully leverage ArC TWO's capabilities to accelerate your research.

Product specifications

Reading operations

Current measurement

- Accuracy: 1% at >16 nA, 10% at >1.6 nA
- Minimum current measurement: ±200 pA
- Maximum current measurement: ±10 mA
- Current measurement resolution: 2.6 pA
- Current measurement time: 1.5 ms

Voltage measurement

- Accuracy: 1% at >20 mV, 10% at >2 mV
- Minimum voltage measurement: ±200 µV
- Maximum voltage measurement: ±10 V
- Voltage measurement resolution: 77 µV
- Voltage measurment time: 10 µs (single sample), 320 µs (averaged)

Writing operations

- Maximum bias voltage: ±13.5 V
- Bias voltage resolution: 305 µV at ±10 V, 610µ V at ±13.5 V, ±20 V extended range
- Bias voltage current limit: 10 mA (200mA across all channels)
- Bias voltage slew rate: 400 mV/µs
- Arbitrary Pulse generator voltage: ±13.5 V, ±20 V extended range
- Arbitrary Pulse generator width: 40 ns - inf
- Arbitrary Pulse generator time resolution: 10 ns
- Arbitrary Pulse generator current limit: 10 mA

Operation intervals

- Minimum READ → WRITE interval: 20 µs
- Minimum WRITE → READ interval: 150 µs

Programmable I/O

- 64 fully independent SMU channels with pulse generators and access to unified current source
- 32 digital outputs with arbitrary high/low levels at ±13.5 V

- 32 digital I/Os with arbitrary high level at 1.8-5.5 V
- 4 arbitrary supplies at ±13.5 V and ±100 mA

Crossbar management

- SMU configuration for up to 32×32 selector enabled crossbar array
- With 32NNA68 daughterboard (included as default):
  - Switchable header pin array for access to all channels
  - 68 pin PLCC socket for packaged samples (up to 1 kbit crossbar arrays)
- Optional 16×16 SMA array daughterboard for probe interface
- Optional 6×6 BNC array daughterboard for probe interface

Software

- ArC2Control Visual Interface for operations on crossbar arrays: Select from built-in experiment modules or develop your own.
- Low-level SDK with Python bindings offers register-level control for mission-critical and highly tailored applications.
- Fully open source (MPL-2.0 for the low-level libraries; LGPLv3 for the GUI)
- Lifetime firmware updates included