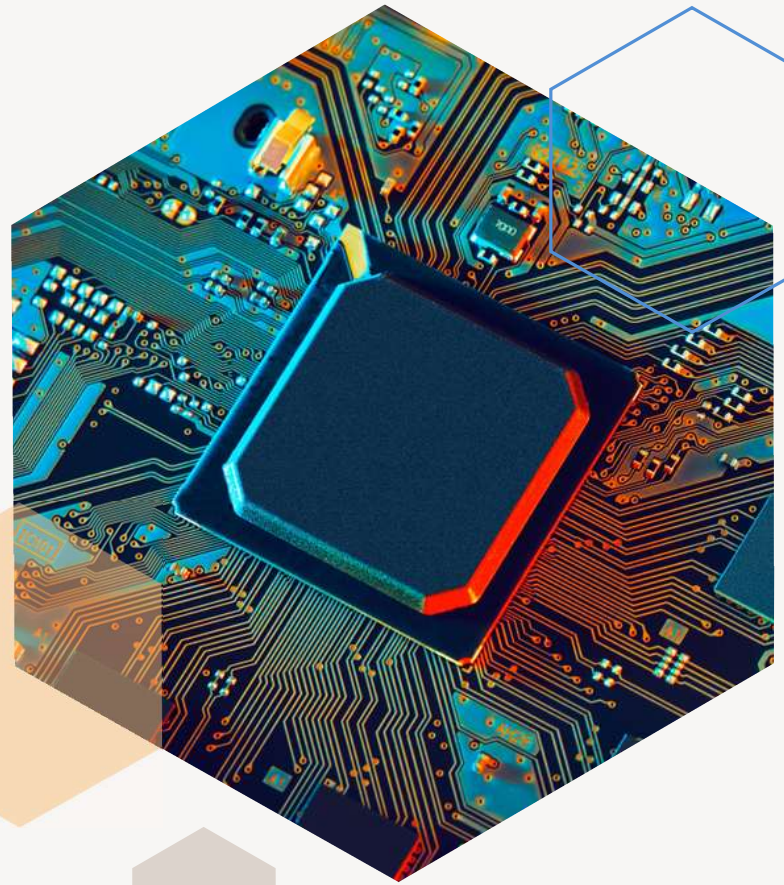
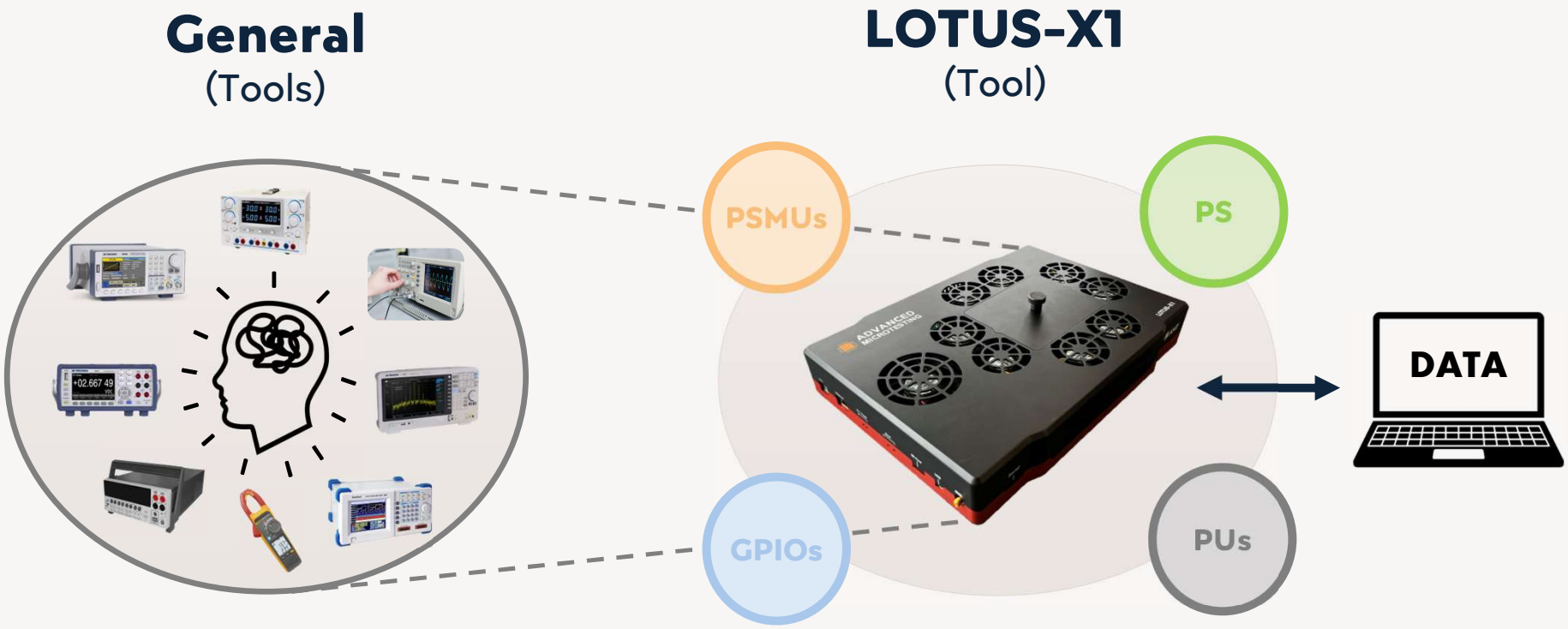
AMT

Advanced Microtesting (AMT)

We make circuit & chip testing more accessible



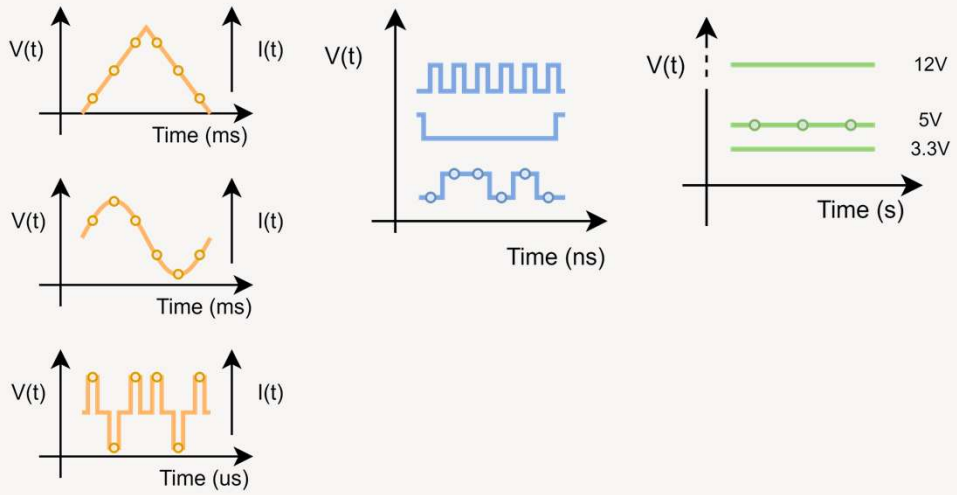
Concept



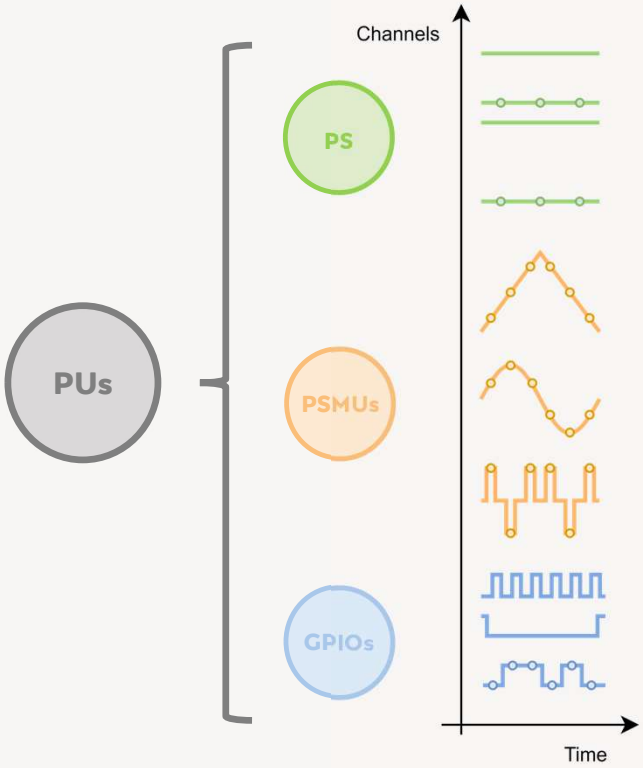
Tools

Generate and **measure** any analog & digital signals...

32 x PSMUs 32 x GPIOs 4 x PS



And **synchronize** all of them together!



Tools

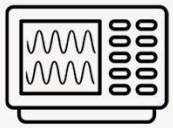
Functionalities*

PSMUs

Pulsed Source Measure Unit (P-SMU)
(32 Analog Channels)

Signal Generators
Analog Signal & Pulse

Voltage:
± 5 V
Min. pulse:
40 ns ~ 200 ns
AWG:
200 KHz @ 32CH ~ 500 KHz @ 8CH



Oscilloscope
Current (I)

Current measurements:
± 200 pA ~ 1 mA
Current ranges:
100 nA ~ 1 mA

PS

Power Supplies
(4 voltage sources)

Functionalities*

VCC & VSS
Positive / Negative voltages

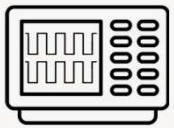
Output source:
Voltage: 1.2 ~ 5 V
Max. current: 100 mA

GPIOs

General-Purpose Input/Output
(32 Digital Channels)

Vector Generators
Digital Signals (SPI, I2C, JTAG, serial, etc.)

Voltage:
0.8 ~ 5 V (variable)
Frequency:
80 ~ 160 MHz resolution

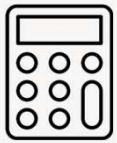


Logic Analyser
Variable Voltage

Voltage:
0.8 ~ 5 V (variable)
Frequency:
Max. 80 ~ 160 MHz

PUs

Processing Units
(CPU + FPGA)



Computing Units
CPU for Python
FPGA for Acceleration

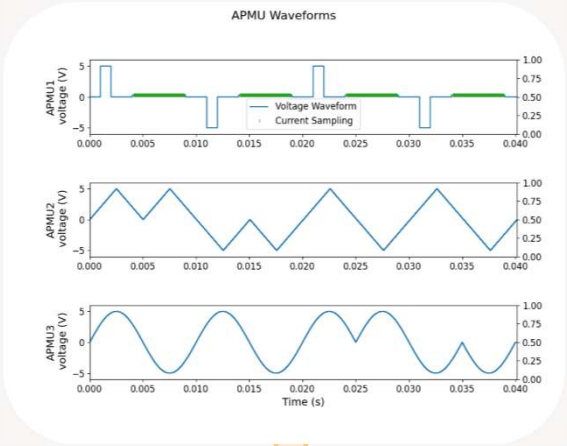
Computing:
CPU CLK: 667 MHz
FPGA CLK: 160 MHz

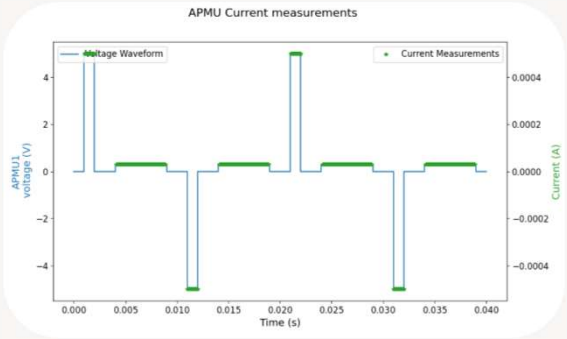
This information does not represent the optimal performance nor the guaranteed specifications; it is merely intended to give users an idea of what can be achieved with this system.

User Interface

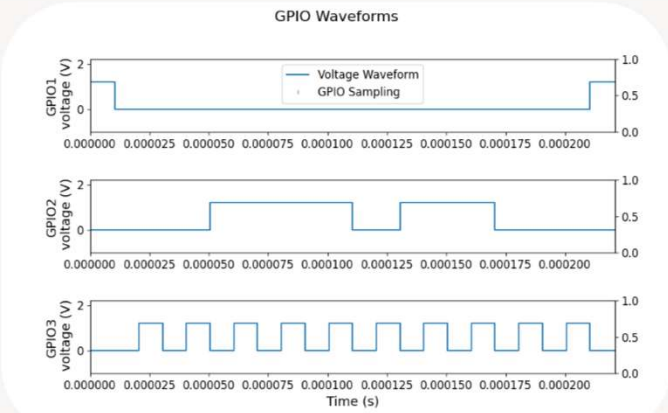
1. Initialize Equipment
2. Create Sequence
3. Execute Sequence
4. Analyze data

PSMUs



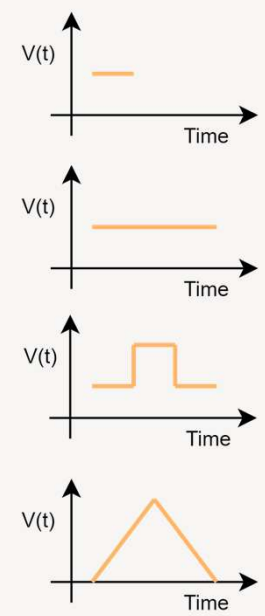


GPIOs

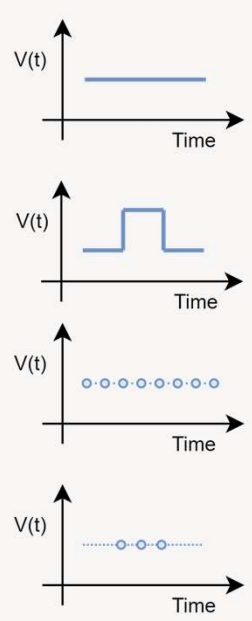


Waveform Creation Functions

1. Single Segment
2. Constant Voltage
3. Single Pulse
4. Voltage Sweep



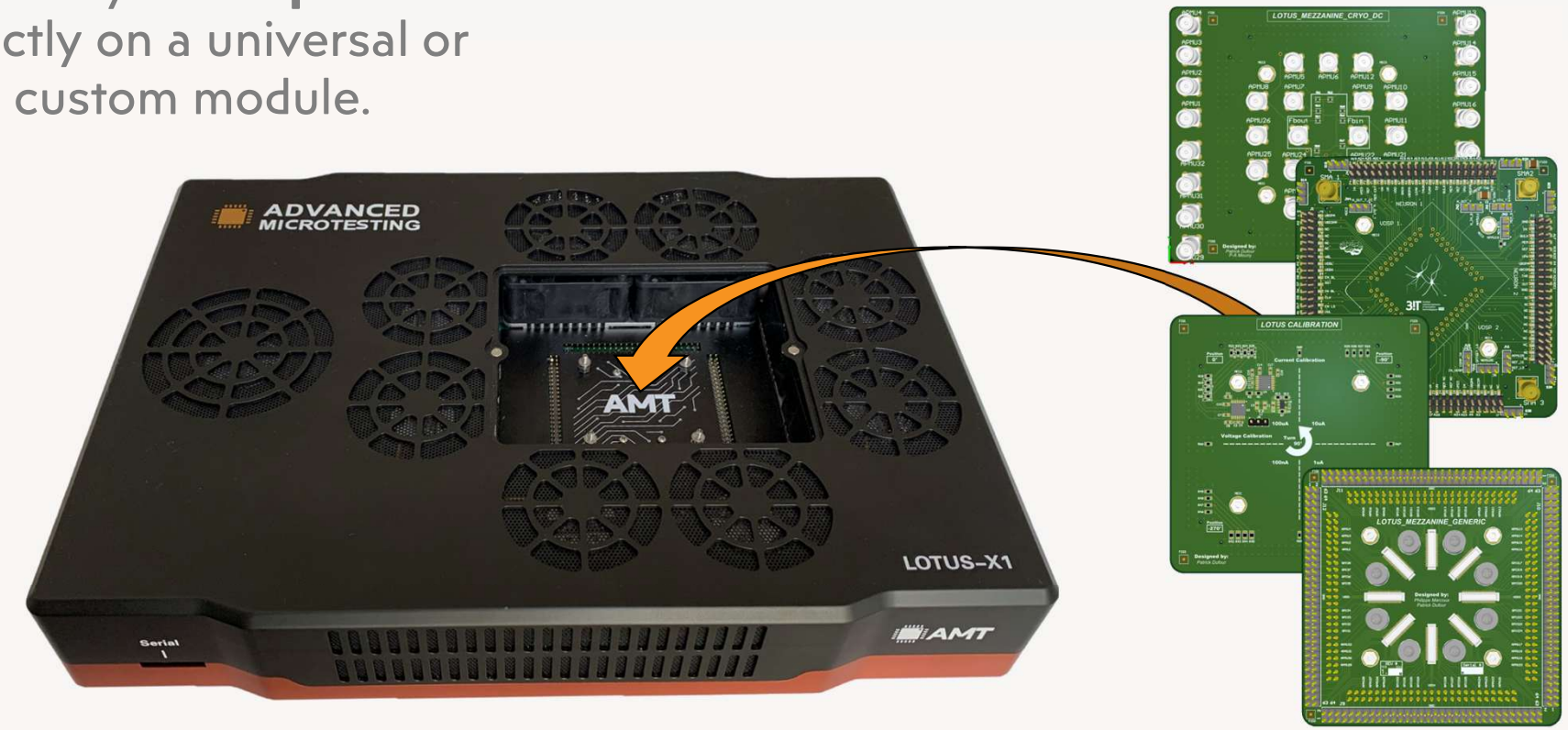
1. Output Segment
2. Output Pulse
3. Input Segment
4. Input Pulse



Test Interface - Module

Connect your **chip/circuit** directly on a universal or custom module.

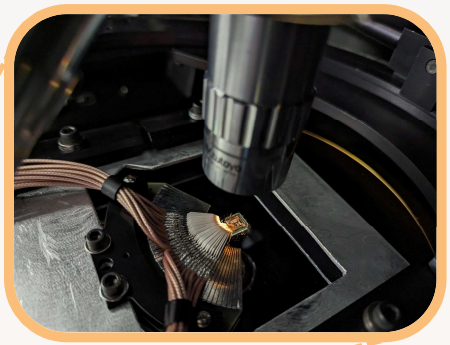
Create your own module or ask us to design it for you!



Test Interface - Module

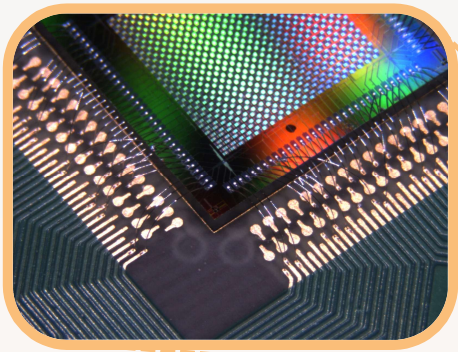
Probe Station

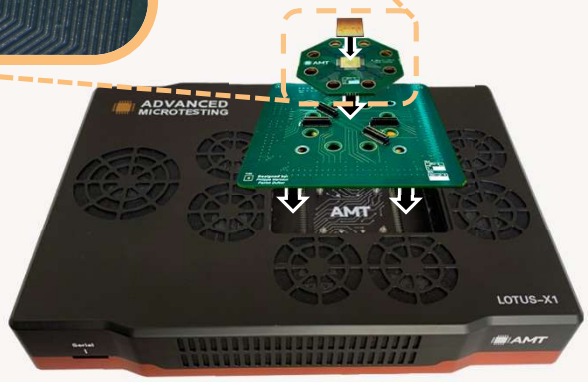
Up to 68 signals
Probecards



Chip Carrier

Up to 256
wire bonding
pads





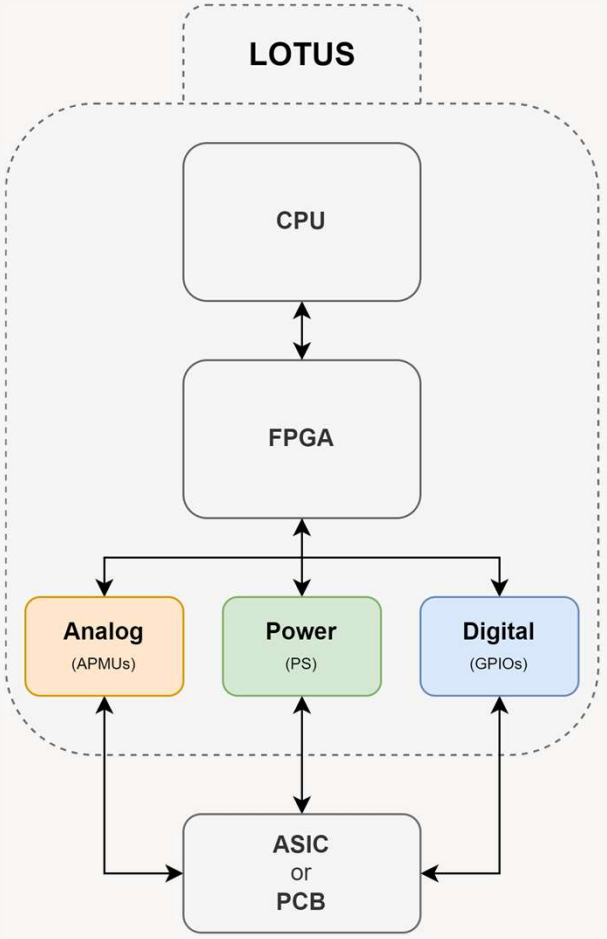
Applications

Device examples:

- Analog memories (RRAM, HZO, etc.)
- Crossbar arrays
- Quantum dot gate control
- Analog and/or digital signal ASICs
- Analog/Digital converters (DAC, ADCs)
- Operational amplifiers
- Transistors
- Diodes
- Sensors

Applications:

- Real-Time demonstrations
- Artificial neural networks with sensors
- Spiking Neural Networks
- Vector-Matrix Multiplications
- Automatic tests and characterization



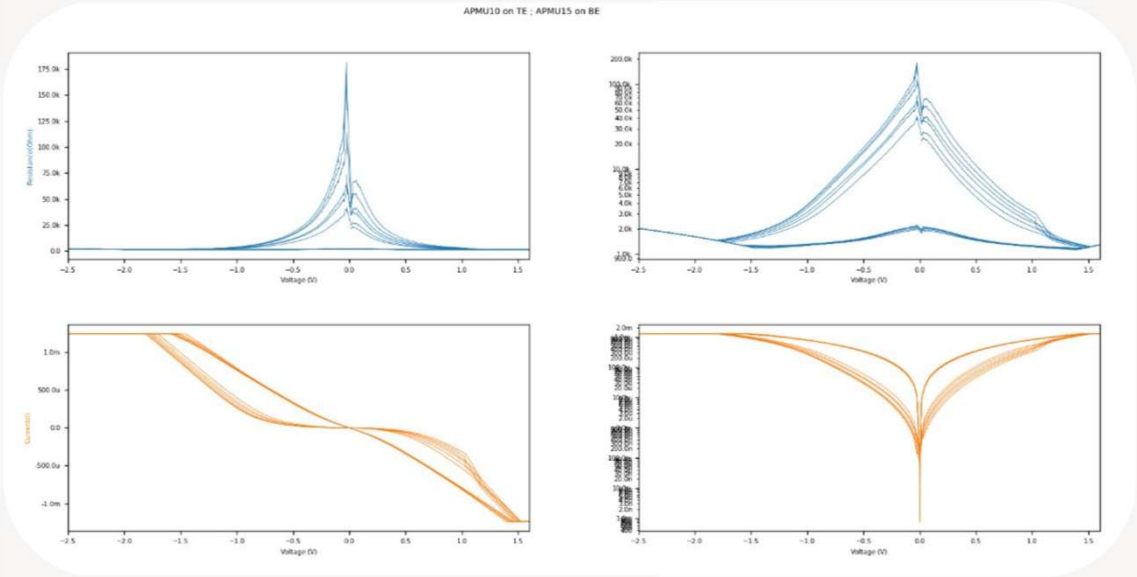
Examples

Resistive memory switching

(resistance and current vs voltage)

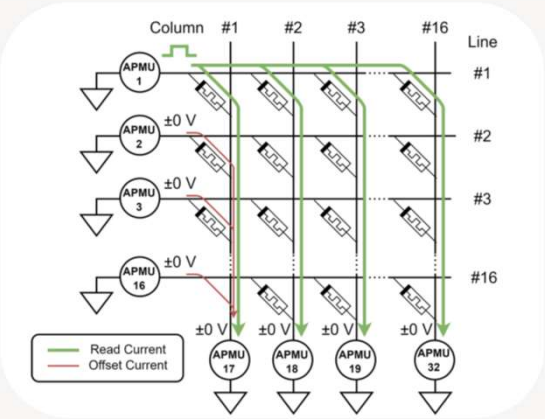
Resistance vs voltage

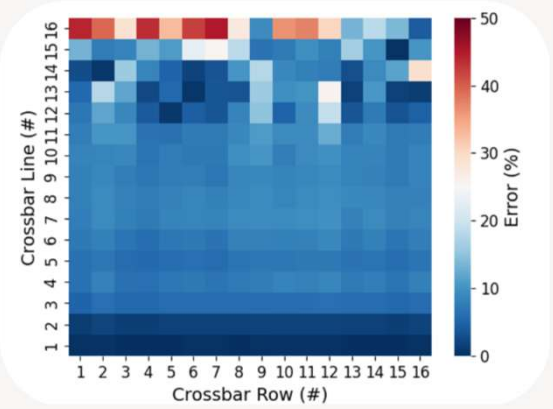
Current vs voltage



Memristor Crossbar Heat map

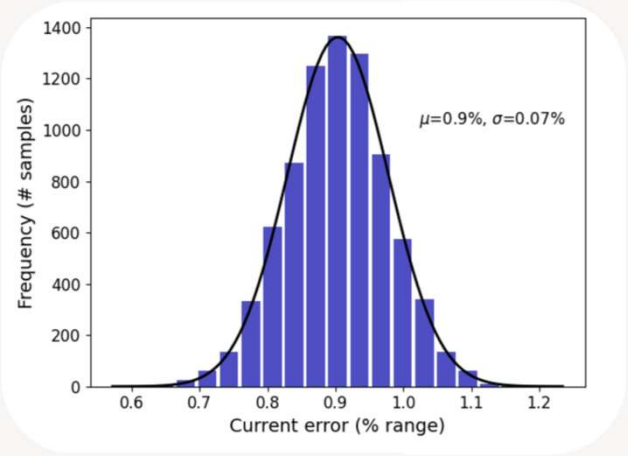
(16x16)





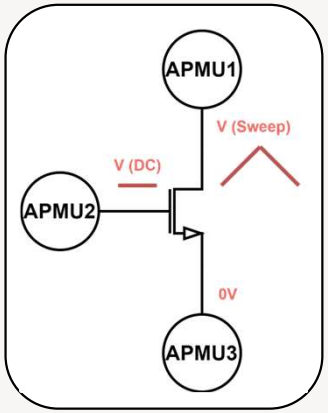
Examples

Noise Figures

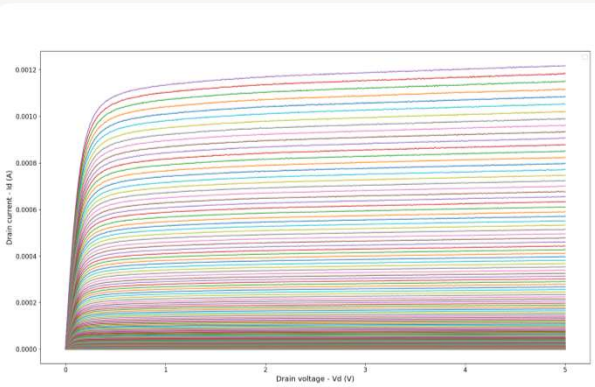


Histogram of current/voltage sampling noise

Transistor Characterization (Id-Vd)



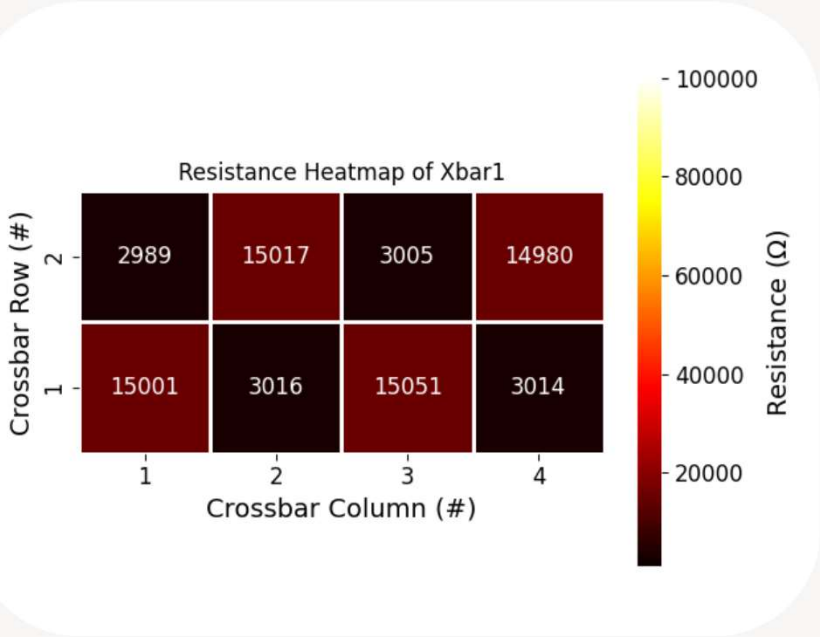
NMOS circuit



IdVd - Drain current vs drain voltage (Gate voltage step)

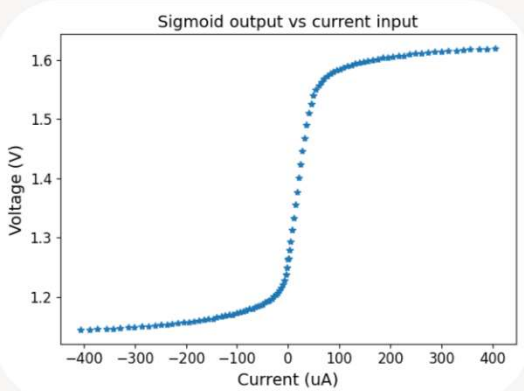
Examples

Crossbar Heat map (2x4)

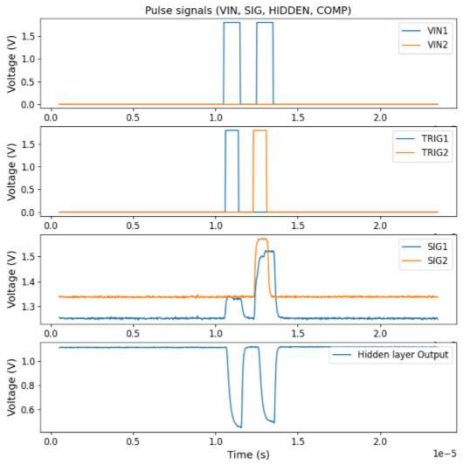


Resistor crossbar resistance heat map

Analog ASIC



Analog sigmoid extraction



APMU Pulses

ASIC outputs

Specifications

PSMUs

Voltage:
- 32 APMU channels
- Voltage: ±5 V
- Voltage resolution: 152 µV

Current:
- Current ranges: 100 nA, 1 µA, 10 µA, 100 µA, 1 mA
- Current resolution: 12.2 pA ~ 122 nA
- Max. output current: 16 mA
- Max. sampling speed: 25 ns
- Memory length: 1 M @ 100 ns, 8192 @ 25 ns

Timings:
- Min. pulse: 40 ns ~ 200 ns (±1 V ~ ±5 V)
- Min read pulse width: 300 ns
- AWG/APG: 200 KHz ~ 500 KHz
- Time resolution: 160 MHz (6.25 ns)

GPIOs

Voltage:
- 32 high-speed GPIO channels
- 8 low-speed GPIO channels
- 1x I2C bus
- 1x to 8x SPI bus
- Voltage: 0.8 V ~ 5 V (variable)
- Voltage resolution: 3.7 mV

Timings:
- Max. frequency: 160 MHz
- Time resolution: 6.25 ns

PS

Variable:
- 3 supplies 0.8 ~ 5V (100 mA)
- 1 supply 2.5 ~ 5V (100 mA)
- Voltage resolution: 23.4 mV

Fixed:
- 1 supply +8 V (500 mA)
- 1 supply -8 V (500 mA)

PUs

FPGA:
- 8192 – 1 M memory buffer
- 160 MHz frequency

CPU:
- 4 Gb RAM
- 1 Gbps Ethernet

**This information does not represent the optimal performance nor the guaranteed specifications; it is merely intended to give users an idea of what can be achieved with this system.*

Questions?

Advanced Microtesting Inc.

info@advancedmicrotesting.com

Contact us for more information!