

## KEYSIGHT TECHNOLOGIES (AGILENT HP)

# 4155C

The Keysight Agilent 4155C Semiconductor Parameter Analyzer is an industry-standard laboratory solution for precise semiconductor device characterization, modeling, and parameter extraction. Equipped with four Medium Power Source Monitor Units (MPSMUs), two Voltage Source Units (VSUs), and two Voltage Monitor Units (VMUs), it offers high-resolution, high-accuracy DC measurements for advanced semiconductor research and quality assurance.

## SPECIFICATIONS

### General

|            |                                                                   |
|------------|-------------------------------------------------------------------|
| Interfaces | GPIB (IEEE-488), LAN (10BASE-T/100BASE-TX), Parallel (Centronics) |
| Display    | 8.4-inch color active matrix LCD, 640×480 VGA resolution          |

### Physical

|                       |                                                                    |
|-----------------------|--------------------------------------------------------------------|
| Power Supply          | 90 V to 264 V AC, 47 Hz to 63 Hz, 450 VA maximum power consumption |
| Operating Temperature | 10 °C to 40 °C °C                                                  |
| Dimensions (W×H×D)    | 426 mm × 235 mm × 524 mm mm                                        |
| Weight                | 21 kg                                                              |

### General System Architecture

|                                         |                               |
|-----------------------------------------|-------------------------------|
| Standard SMU Configuration              | 4× Medium Power SMUs (MPSMUs) |
| Voltage Source Units (VSU)              | 2× VSUs                       |
| Voltage Monitor Units (VMU)             | 2× VMUs                       |
| Ground Unit (GNDU) Output Voltage       | 0 V ± 100 μV                  |
| Ground Unit (GNDU) Maximum Sink Current | 1.6 A                         |

### Source Monitor Unit (SMU) Specifications

|                                              |                                                                 |
|----------------------------------------------|-----------------------------------------------------------------|
| MPSMU Maximum Voltage Force/Measure Range    | ±100 V                                                          |
| MPSMU Maximum Current Force/Measure Range    | ±100 mA                                                         |
| MPSMU Voltage Force/Measure Ranges           | 2 V, 20 V, 40 V, 100 V                                          |
| MPSMU Current Force/Measure Ranges           | 1 nA, 10 nA, 100 nA, 1 μA, 10 μA, 100 μA, 1 mA, 10 mA, 100 mA   |
| MPSMU Minimum Current Measurement Resolution | 10 fA                                                           |
| MPSMU Minimum Voltage Measurement Resolution | 2 μV                                                            |
| MPSMU Output Limits                          | 100 mA at up to 20 V, 50 mA at up to 40 V, 20 mA at up to 100 V |

## Voltage Source Unit (VSU) Specifications

|                                      |        |
|--------------------------------------|--------|
| Number of VSU Channels               | 2      |
| VSU Voltage Force Range              | ±20 V  |
| VSU Minimum Voltage Force Resolution | 20 µV  |
| VSU Maximum Output Current           | 100 mA |

## Voltage Monitor Unit (VMU) Specifications

|                                            |         |
|--------------------------------------------|---------|
| Number of VMU Channels                     | 2       |
| VMU Voltage Measurement Range              | ±20 V   |
| VMU Minimum Voltage Measurement Resolution | 0.2 µV  |
| VMU Input Impedance                        | >= 1 GΩ |

## Measurement Modes & Stimulus Functions

|                                |                                                         |
|--------------------------------|---------------------------------------------------------|
| Sweep Measurement Modes        | Linear sweep, Log sweep, Single sweep, Double sweep     |
| Pulsed Sweep Measurement Modes | Pulsed sweep, Pulsed linear sweep, Pulsed log sweep     |
| Sampling Measurement Modes     | Linear sampling, Log sampling (time-domain measurement) |
| Hold Time Setting Range        | 0 to 655.35 s (10 ms resolution)                        |
| Delay Time Setting Range       | 0 to 65.535 s (100 µs resolution)                       |

## Connectivity, Interfaces & Storage

|               |                                                 |
|---------------|-------------------------------------------------|
| Storage Media | 3.5-inch floppy disk drive (1.44 MB DOS format) |
|---------------|-------------------------------------------------|

## Power & Operating Environment

|                           |                                |
|---------------------------|--------------------------------|
| Operating Humidity Range  | 20% to 70% RH (non-condensing) |
| Storage Temperature Range | -22 °C to 60 °C                |

## Sweep Measurement

|                                 |            |
|---------------------------------|------------|
| Sweep Measurement Maximum Steps | 1001 steps |
|---------------------------------|------------|

## Sampling Measurement

|                                     |                                                                               |
|-------------------------------------|-------------------------------------------------------------------------------|
| Sampling Measurement Maximum Points | 10001 points                                                                  |
| Sampling Interval Range             | 60 µs to 26.6 s (10 µs resolution for < 10 ms, 100 µs resolution for ≥ 10 ms) |

## Measurement Performance

|                                            |                                      |
|--------------------------------------------|--------------------------------------|
| High-Speed ADC Integration Time Range      | 80 µs to 10.24 ms (10 µs resolution) |
| High-Resolution ADC Integration Time Range | 1 PLC to 100 PLC                     |

## MPSMU Specifications

|                            |     |
|----------------------------|-----|
| MPSMU Maximum Output Power | 2 W |
|----------------------------|-----|

## Software & Control

|                             |      |
|-----------------------------|------|
| Command Languages Supported | FLEX |
|-----------------------------|------|

System Expansion Options

|                                       |                                                      |
|---------------------------------------|------------------------------------------------------|
| Pulse Generator Unit (PGU) Capability | Up to 2 channels (requires optional 41501B Expander) |
| Maximum SMU Channels Support          | Up to 6 SMUs (requires optional 41501B Expander)     |

Pulse Generator Unit (PGU)

|                                |                                                                     |
|--------------------------------|---------------------------------------------------------------------|
| PGU Pulse Width Range          | 1.0 $\mu$ s to 9.99 s (requires optional 41501B Expander with PGUs) |
| PGU Pulse Period Range         | 2.0 $\mu$ s to 10.0 s (requires optional 41501B Expander with PGUs) |
| PGU Amplitude Range            | $\pm$ 40 V (into open circuit, with 41501B expander)                |
| PGU Pulse Delay Range          | 0 to 9.99 s (with 41501B expander)                                  |
| PGU Pulse Rise/Fall Time Range | 100 ns to 10 ms (with 41501B expander)                              |

Interfaces

|               |          |
|---------------|----------|
| LAN Interface | 10BASE-T |
|---------------|----------|

Inputs & Outputs

|                       |                                                         |
|-----------------------|---------------------------------------------------------|
| MPSMU Connector Type  | Triaxial (3-lug)                                        |
| GNDU Connector Type   | Triaxial (3-lug)                                        |
| VSU Connector Type    | BNC                                                     |
| VMU Connector Type    | BNC                                                     |
| R-Box Control Port    | 15-pin D-sub connector for 16441A R-Box control         |
| Safety Interlock Port | 6-pin connector (for 16442A test fixture or shield box) |

Control & Automation

|                               |                           |
|-------------------------------|---------------------------|
| Built-in Programming Language | Instrument BASIC (IBASIC) |
|-------------------------------|---------------------------|

System Expandability

|                              |                                                                 |
|------------------------------|-----------------------------------------------------------------|
| Expander Compatibility       | Agilent 41501B SMU and Pulse Generator Expander                 |
| Measurement Channel Capacity | Up to 6 SMUs, 2 VSUs, 2 VMUs, and 2 PGUs (with 41501B expander) |

Analysis & Software

|                        |                                                                          |
|------------------------|--------------------------------------------------------------------------|
| Display Analysis Tools | Marker, Double Marker, Cursor, Line (for slope/intercept), Auto Analysis |
|------------------------|--------------------------------------------------------------------------|

Display

|                    |                               |
|--------------------|-------------------------------|
| Display Resolution | 640 $\times$ 480 pixels (VGA) |
|--------------------|-------------------------------|

TECHNOLOGY

Semiconductor Parameter Analyzer

APPLICATIONS

Semiconductor device characterization, parametric modeling, and reliability testing

Generated by SpecAtlasHub (specatlashub.com). Specifications are compiled from available sources and are subject to change — verify critical values against the manufacturer before purchase.