

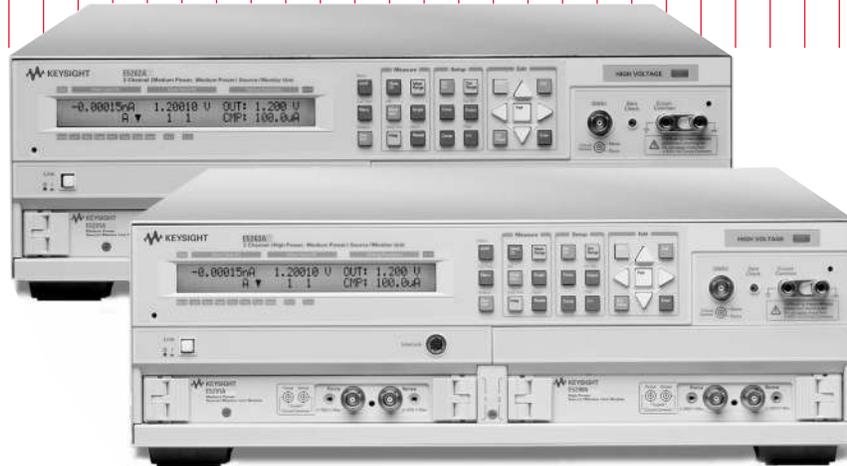
Keysight E5262A

2 Channel (Medium Power, Medium Power)
Source/Monitor Unit

Keysight E5263A

2 Channel (High Power, Medium Power)
Source/Monitor Unit

Technical Overview



Introduction

The Keysight Technologies, Inc. E5262A and E5263A are fixed-configuration dual SMU instruments. The E5262A contains two high speed medium power SMUs (MPSMUs), and the E5263A contains one high speed medium power SMU (MPSMU) and one high power SMU (HPSMU).

E5262A and E5263A basic features

- Perform high-speed, dc parametric measurements
- User interface allows spot measurements to be made from the front panel
- High-speed ADC present on each installed SMU
- 2.2 Amp ground unit
- BNC trigger-in and trigger-out connectors
- 16 general-purpose digital I/Os
- Program memory
- GPIB port for instrument control
- Self-test, self-calibration, diagnostics

Measurement modes

The Keysight E5262A and E5263A support the following measurement modes:

- Spot
- Pulsed spot
- Quasi-pulsed spot
- Staircase sweep
- Multi-channel sweep
- Pulsed sweep
- Staircase sweep with pulsed bias
- Linear search
- Binary search

Hardware

Specification conditions

The measurement and output accuracy are specified at the module connector terminals when referenced to the Zero Check terminal under the following conditions:

1. Temperature: $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ (double for 5°C to 18°C , and 28°C to 40°C if not noted otherwise)
2. After 40 minutes warm-up
3. Ambient temperature change less than $\pm 1^{\circ}\text{C}$ after auto calibration execution
4. Measurement made within one hour after auto calibration execution
5. Averaging (high-speed per-SMU ADC): 128 samples in 1 PLC; Integration time
6. Filter: ON (for SMUs)
7. Kelvin connection
8. Calibration period: 1 year

Note: This document lists specifications and supplemental information for the E5262A and E5263A and its associated modules. The specifications are the standards against which the E5262A and E5263A and its associated modules are tested. When the E5262A and E5263A or any of its associated modules are shipped from the factory, they meet the specifications. The “supplemental” information and “typical” entries in the following specifications are not warranted, but provide useful information about the functions and performance of the instrument.

E5262A and E5263A Mainframe Specification

The E5262A and E5263A are identical in form and function except for their SMU configuration.

The E5262A supports two high speed medium power SMUs (MPSMUs).

| Description | Range of operation | Minimum resolution |
|------------------|------------------------------------|--------------------------|
| High speed MPSMU | -100 V to 100 V, -200 mA to 200 mA | 100 μV , 5 pA |

The E5263A supports one high speed medium power SMU (MPSMUs) and one high speed high power SMU (HPSMU).

| Description | Range of operation | Minimum resolution |
|------------------|------------------------------------|--------------------------|
| High speed HPSMU | -200 V to 200 V, -1 A to 1 A | 100 μV , 5 pA |
| High speed MPSMU | -100 V to 100 V, -200 mA to 200 mA | 100 μV , 5 pA |

Maximum output power

There are no power restrictions on the E5262A and E5263A mainframes. Both mainframes support having both of their modules simultaneously output maximum voltage or current.

Maximum voltage between common and ground

Maximum common to ground voltage must be $\pm 42\text{ V}$

Pulse measurement

Pulse width: 500 μsec to 2 s

Pulse period: 5 ms to 5 s

Period \geq width + 2 ms (when width \leq 100 ms)

Period \geq width + 10 ms (when width $>$ 100 ms)

Pulse resolution: 100 μs

Ground unit (GNDU) specification

The GNDU is furnished with the E5262A and E5263A mainframes.

Output voltage: $0\text{ V} \pm 100\ \mu\text{V}$

Maximum sink current: 2.2 A

Output terminal/connection: Triaxial connector, Kelvin (remote sensing)

GNDU supplemental information

Load capacitance: 1 μF

Cable resistance:

For $IS \leq 1.6\text{ A}$: Force line R $< 1\ \Omega$

For $1.6\text{ A} < IS \leq 2.0\text{ A}$: Force line R $< 0.7\ \Omega$

For $2.0\text{ A} < IS \leq 2.2\text{ A}$: Force line R $< 0.35\ \Omega$

For all cases: Sense line R $\leq 10\ \Omega$

Where IS is the current being sunk by the GNDU.

MPSMU (Medium Power SMU) Module Specifications

Voltage range, resolution, and accuracy (MPSMU)

| Voltage range | Force resolution | Measure resolution | Force accuracy ¹ | Measure accuracy ¹ | Maximum current |
|---------------|------------------|--------------------|-----------------------------|-------------------------------|-----------------|
| ±2 V | 100 μV | 100 μV | ±(0.03 % + 900 μV) | ±(0.03 % + 700 μV) | 200 mA |
| ±20 V | 1 mV | 1 mV | ±(0.03 % + 4 mV) | ±(0.03 % + 4 mV) | 200 mA |
| ±40 V | 2 mV | 2 mV | ±(0.03 % + 7 mV) | ±(0.03 % + 8 mV) | ² |
| ±100 V | 5 mV | 5 mV | ±(0.04 % + 15 mV) | ±(0.03 % + 20 mV) | ³ |

- ± (% of output/measured value + offset voltage)
- 200 mA ($V_o \leq 20$ V), 50 mA (20 V < $V_o \leq 40$ V), V_o is the output voltage in volts.
- 200 mA ($V_o \leq 20$ V), 50 mA (20 V < $V_o \leq 40$ V), 20 mA (40 V < $V_o \leq 100$ V), V_o is the output voltage in volts.

Current range, resolution, and accuracy (MPSMU)

| Current range | Force resolution | Measure resolution ⁴ | Force accuracy ¹ | Measure accuracy ^{1,2} | Maximum voltage |
|---------------|------------------|---------------------------------|---|--|-----------------|
| ±100 nA | 5 pA | 5 pA | ±(0.12 % + 50 pA + 5 pA x ($V_o/25$)) | ±(0.1 % + 30 pA + 5 pA x ($V_o/25$)) | 100 V |
| ±1 μA | 50 pA | 50 pA | ±(0.12 % + 400 pA + 50 pA x ($V_o/25$)) | ±(0.1 % + 200 pA + 50 pA x ($V_o/25$)) | 100 V |
| ±10 μA | 500 pA | 500 pA | ±(0.12 % + 5 nA + 500 pA x ($V_o/25$)) | ±(0.1 % + 3 nA + 500 pA x ($V_o/25$)) | 100 V |
| ±100 μA | 5 nA | 5 nA | ±(0.12 % + 40 nA + 5 nA x ($V_o/25$)) | ±(0.1 % + 20 nA + 5 nA x ($V_o/25$)) | 100 V |
| ±1 mA | 50 nA | 50 nA | ±(0.12 % + 500 nA + 50 nA x ($V_o/25$)) | ±(0.1 % + 300 nA + 50 nA x ($V_o/25$)) | 100 V |
| ±10 mA | 500 nA | 500 nA | ±(0.12 % + 4 μA + 500 nA x ($V_o/25$)) | ±(0.1 % + 2 μA + 500 nA x ($V_o/25$)) | 100 V |
| ±100 mA | 5 μA | 5 μA | ±(0.12 % + 50 μA + 5 μA x ($V_o/25$)) | ±(0.1 % + 30 μA + 5 μA x ($V_o/25$)) | ³ |
| ±200 mA | 10 μA | 10 μA | ±(0.12 % + 100 μA + 10 μA x ($V_o/50$)) | ±(0.1 % + 60 μA + 10 μA x ($V_o/50$)) | ⁴ |

- ± (% of output/measured value + offset current A (fixed part determined by the output/measurement range + proportional part that is multiplied by V_o))
- Round up below decimal point for the value of ($V_o/25$) and ($V_o/50$)
- 100 V ($I_o \leq 20$ mA), 40 V (20 mA < $I_o \leq 50$ mA), 20 V (50 mA < $I_o \leq 200$ mA), I_o is the output current in amps.

Power consumption (MPSMU)

Voltage source mode:

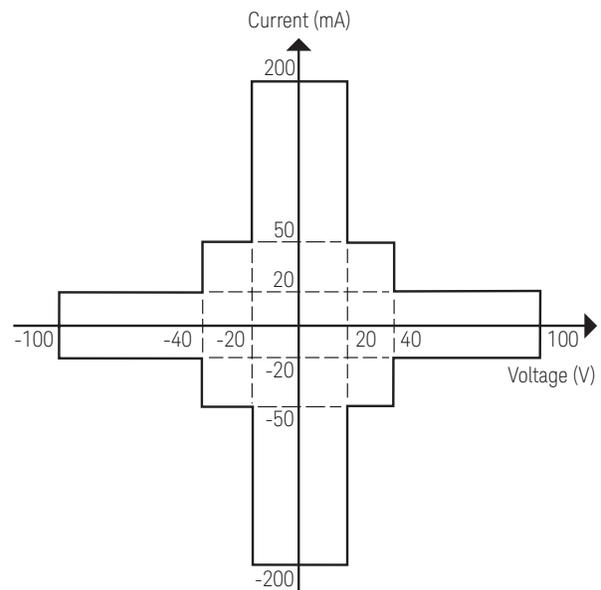
| Voltage range | Power |
|---------------|-----------------|
| 2 V | 20 x I_c (W) |
| 20 V | 20 x I_c (W) |
| 40 V | 40 x I_c (W) |
| 100 V | 100 x I_c (W) |

Where I_c is the current compliance setting.

Current source mode:

| Voltage compliance | Power |
|---------------------|-----------------|
| $V_c \leq 20$ | 20 x I_o (W) |
| $20 < V_c \leq 40$ | 40 x I_o (W) |
| $40 < V_c \leq 100$ | 100 x I_o (W) |

Where V_c is the voltage compliance setting and I_o is output current.



MPSMU measurement and output range

Output terminal/connection:

Triaxial connector, Kelvin (remote sensing)

Voltage/current compliance (limiting)

The SMU can limit output voltage or current to prevent damaging the device under test.

Voltage: 0 V to ± 100 V

Current: ± 100 pA to ± 200 mA

Compliance accuracy: Same as the current (or voltage) set accuracy.

MPSMU supplemental information

Maximum allowable cable resistance (Kelvin connection):

Force Line: 10 Ω ($I \leq 100$ mA)

Force Line: 1.5 Ω (100 mA $< I \leq 200$ mA)

Sense Line: 10 Ω (All cases)

Voltage source output resistance:

0.3 Ω typical (Force line, non-Kelvin connection)

Voltage measurement input resistance: $\geq 10^{13}$ Ω

Current source output resistance: $\geq 10^{13}$ Ω (1 nA range)

Current compliance setting accuracy (for opposite polarity):

For 100 nA to 200 mA ranges: I setting accuracy ± 2.5 % of range

Maximum capacitive load:

For 100 nA to 10 mA ranges: 10 nF

For 100 mA to 200 mA ranges: 100 μ F

Maximum guard capacitance: 900 pF

Maximum shield capacitance: 5000 pF

Maximum guard offset voltage: ± 1 mV

Noise characteristics (typical, filter ON):

Voltage source: 0.01 % of V range (rms)

Current source: 0.1 % of I range (rms)

Overshoot (typical, filter ON):

Voltage source: 0.03 % of V range

Current source: 1 % of I range

Range switching transient noise (typical, filter ON):

Voltage ranging: 250 mV

Current ranging: 10 mV

Slew rate: 0.2 V/ μ s

SMU pulse setting accuracy (fixed measurement range):

Width: 0.5 % + 50 μ s

Period: 0.5 % + 100 μ s

Trigger out delay (pulsed measurements):

0 to 32.7 ms with 100 μ s resolution ($<$ pulse width)

HPSMU (High Power SMU) Module Specifications

Voltage range, resolution, and accuracy (HPSMU)

| Voltage range | Force resolution | Measure resolution | Force accuracy ¹ | Measure accuracy ¹ | Maximum current |
|---------------|------------------|--------------------|-----------------------------|-------------------------------|-----------------|
| ± 2 V | 100 μ V | 100 μ V | $\pm(0.03$ % + 900 μ V) | $\pm(0.03$ % + 700 μ V) | 1 A |
| ± 20 V | 1 mV | 1 mV | $\pm(0.03$ % + 4 mV) | $\pm(0.03$ % + 4 mV) | 1 A |
| ± 40 V | 2 mV | 2 mV | $\pm(0.03$ % + 7 mV) | $\pm(0.03$ % + 8 mV) | ² |
| ± 100 V | 5 mV | 5 mV | $\pm(0.04$ % + 15 mV) | $\pm(0.03$ % + 20 mV) | ³ |
| ± 200 V | 10 mV | 10 mV | $\pm(0.045$ % + 30 mV) | $\pm(0.035$ % + 40 mV) | ⁴ |

1. \pm (% of output/measured value + offset voltage V)

2. 1 A ($V_o \leq 20$ V), 500 mA (20 V $< V_o \leq 40$ V), V_o is the output voltage in volts.

3. 1 A ($V_o \leq 20$ V), 500 mA (20 V $< V_o \leq 40$ V), 125 mA (40 V $< V_o \leq 100$ V), V_o is the output voltage in volts.

4. 1 A ($V_o \leq 20$ V), 500 mA (20 V $< V_o \leq 40$ V), 125 mA (40 V $< V_o \leq 100$ V), 50 mA (100 V $< V_o \leq 200$ V), V_o is the output voltage in volts.

Current range, resolution, and accuracy (HPSMU)

| Current range | Force resolution | Measure resolution | Force accuracy ^{1,2} | Measure accuracy ^{1,2} | Maximum voltage |
|-------------------|------------------|--------------------|--|--|-----------------|
| ± 100 nA | 5 pA | 5 pA | $\pm(0.12$ % + 50 pA + 5 pA x ($V_o/25$)) | $\pm(0.1$ % + 30 pA + 5 pA x ($V_o/25$)) | 200 V |
| ± 1 μ A | 50 pA | 50 pA | $\pm(0.12$ % + 400 pA + 50 pA x ($V_o/25$)) | $\pm(0.1$ % + 200 pA + 50 pA x ($V_o/25$)) | 200 V |
| ± 10 μ A | 500 pA | 500 pA | $\pm(0.12$ % + 5 nA + 500 pA x ($V_o/25$)) | $\pm(0.1$ % + 3 nA + 500 pA x ($V_o/25$)) | 200 V |
| ± 100 μ A | 5 nA | 5 nA | $\pm(0.12$ % + 40 nA + 5 nA x ($V_o/25$)) | $\pm(0.1$ % + 20 nA + 5 nA x ($V_o/25$)) | 200 V |
| ± 1 mA | 50 nA | 50 nA | $\pm(0.12$ % + 500 nA + 50 nA x ($V_o/25$)) | $\pm(0.1$ % + 300 nA + 50 nA x ($V_o/25$)) | 200 V |
| ± 10 mA | 500 nA | 500 nA | $\pm(0.12$ % + 4 μ A + 500 nA x ($V_o/25$)) | $\pm(0.1$ % + 2 μ A + 500 nA x ($V_o/25$)) | 200 V |
| ± 100 mA | 5 μ A | 5 μ A | $\pm(0.12$ % + 50 μ A + 5 μ A x ($V_o/25$)) | $\pm(0.1$ % + 30 μ A + 5 μ A x ($V_o/25$)) | ³ |
| ± 1 A | 50 μ A | 50 μ A | $\pm(0.5$ % + 500 μ A + 50 μ A x ($V_o/25$)) | $\pm(0.5$ % + 300 μ A + 50 μ A x ($V_o/25$)) | ⁴ |

1. \pm (% of output/measured value + offset current A (fixed part determined by the output/measurement range + proportional part that is multiplied by V_o))

2. Round up below decimal point for the value of ($V_o/25$).

3. 200 V ($I_o \leq 50$ mA), 100 V (50 mA $< I_o \leq 100$ mA)

4. 200 V ($I_o \leq 50$ mA), 100 V (50 mA $< I_o \leq 125$ mA), 40 V (125 mA $< I_o \leq 500$ mA), 20 V (500 mA $< I_o \leq 1$ A), I_o is the output current in amps.

Power consumption (HPSMU)

Voltage source mode:

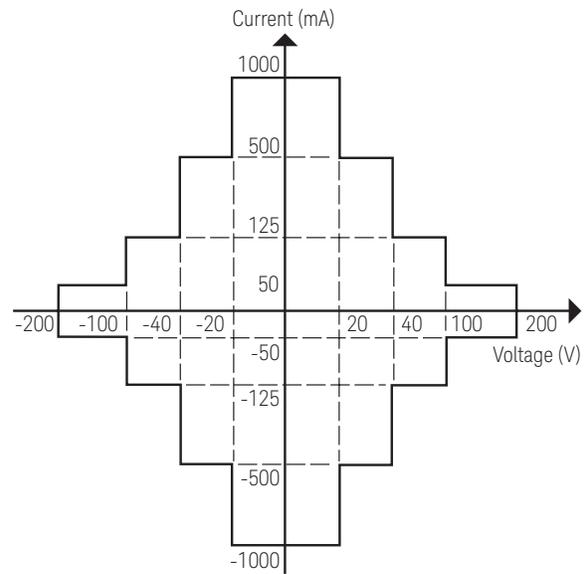
| Voltage range | Power |
|---------------|--------------------------|
| 2 V | 20 x I _c (W) |
| 20 V | 20 x I _c (W) |
| 40 V | 40 x I _c (W) |
| 100 V | 100 x I _c (W) |
| 200 V | 200 x I _c (W) |

Where I_c is the current compliance setting.

Current source mode:

| Voltage compliance | Power |
|----------------------------|--------------------------|
| V _c ≤ 20 | 20 x I _o (W) |
| 20 < V _c ≤ 40 | 40 x I _o (W) |
| 40 < V _c ≤ 100 | 100 x I _o (W) |
| 100 < V _c ≤ 200 | 200 x I _o (W) |

Where V_c is the voltage compliance setting and I_o is output current.



HPSMU measurement and output range

Output terminal/connection:

Triaxial connector, Kelvin (remote sensing)

Voltage/current compliance (limiting)

The SMU can limit output voltage or current to prevent damaging the device under test.

Voltage: 0 V to ± 200 V

Current: ± 100 pA to ± 1 A

Compliance accuracy: Same as the current (or voltage) set accuracy.

HPSMU supplemental information

Maximum allowable cable resistance (Kelvin connection):

Force line: 10 Ω (I ≤ 100 mA)

Force line: 1.5 Ω (100 mA < I ≤ 1 A)

Sense line: 10 Ω (All cases)

Voltage source output resistance: 0.2 Ω typical (Force line, non-Kelvin connection)

Voltage measurement input resistance: ≥ 10¹³ Ω

Current source output resistance: ≥ 10¹³ Ω (1 nA range)

Current compliance setting accuracy (for opposite polarity):

For 1 nA to 10 nA ranges: I setting accuracy ± 12 % of range

For 100 nA to 1 A ranges: I setting accuracy ± 2.5 % of range

Maximum capacitive load:

For 100 nA to 10 mA ranges: 10 nF

For 100 mA to 1 A ranges: 100 μF

Maximum guard capacitance: 900 pF

Maximum shield capacitance: 5000 pF

Maximum guard offset voltage: ± 1 mV

Noise characteristics (typical, filter ON):

Voltage source: 0.01 % of V range (rms)

Current source: 0.1 % of I range (rms)

Overshoot (typical, filter ON):

Voltage source: 0.03 % of V range

Current source: 1 % of I range

Range switching transient noise (typical, filter ON):

Voltage ranging: 250 mV

Current ranging: 10 mV

Slew rate: 0.2 V/μs

SMU pulse setting accuracy (fixed measurement range):

Width: 0.5 % + 50 μs

Period: 0.5 % + 100 μs

Trigger out delay (pulsed measurements):

0 to 32.7 ms with 100 μs resolution (< pulse width)

Functions

Front panel operations

Display

- Display error messages
- Display spot measurement set value
- Display spot measurement result

Keypad operations

- Set GPIB address
- Set local/remote mode
- Select measurement channel
- Set spot measurement set value
- Start calibration/diagnostics

MPSMU and HPSMU Measurement Mode Details

Spot measurement mode

Applies voltage or current, then measures voltage or current. A maximum of two measurement channels can be used.

Staircase sweep measurement mode

Applies staircase sweep voltage or current, and measures voltage or current at each sweep step. A maximum of two measurement channels can be used. An extra sweep source forces the staircase sweep output synchronized to the primary sweep output. Linear or log sweeps can be performed.

Number of steps: 1 – 1,001

Hold time: 0 – 655.35 s, 1 ms resolution

Delay time: 0 – 65.5350 s, 100 μ s resolution

Multi-channel sweep measurement mode

Applies staircase sweep voltage or current using multiple sweep sources, and perform staircase sweep measurement. Linear or log sweeps can be performed.

Number of steps: 1– 1,001

Hold time: 0 – 655.35 s, 1 ms resolution

Delay time: 0 – 65.5350 s, 100 μ s resolution

Pulsed spot measurement mode

Applies pulsed voltage or current, and measures voltage or current.

Pulse width: 500 μ s to 2 s, 100 μ s resolution

Pulse period: 5 ms to 5 s 100 μ s resolution

– Period \geq width + 2 ms (when width \leq 100 ms)

– Period \geq width + 10 ms (when width > 100 ms)

Maximum pulse duty: 50 %

Pulsed sweep measurement mode

Applies pulsed sweep voltage or current, and measures voltage or current at each sweep step. An extra sweep source can be used to force the staircase sweep output synchronized to the pulsed sweep output.

Staircase sweep with pulsed bias measurement mode

Applies pulsed voltage or current, and performs staircase sweep measurement. The staircase sweep output is synchronized to the pulsed bias. A synchronous staircase sweep source is also available.

Quasi-pulsed spot measurement mode

Applies quasi-pulsed voltage or current, and measures voltage or current.

Search measurement mode (liner search and binary search)

Applies voltage or current, and measures voltage or current. Repeats this for various output values until the search stop condition is satisfied. Synchronous output is available.

Time Stamp

The E5262A and E5263A support a time stamp function utilizing an internal quartz clock.

Resolution: 100 μ s

Program Memory

The E5262A and E5263A contain (volatile) memory that can be used to increase test measurement throughput. Program memory allows the storage of program code in the E5262A and E5263A, eliminating the need to communicate over the GPIB interface. In addition, input data can be passed to code sequences stored in program memory.

Maximum lines of storable code: 40,000

Maximum number of program sequences: 2,000

Output Data Buffer

The number of data points that can be stored in the data buffer varies with the choice of the output data format.

Minimum number of storable data Points: 34,034

Trigger I/O

Trigger in/out synchronization pulses before and after setting and measuring dc voltage and current. Arbitrary trigger events can be masked or activated independently.

Input

An external trigger input signal can be used to do any of the following:

1. Start a measurement
2. Start a measurement at each sweep step for a staircase sweep or multi channel sweep measurement
3. Start the source output at each sweep step for a staircase sweep, pulsed sweep, staircase sweep with pulsed bias, or multi-channel sweep measurement.
4. Start the pulsed output for a pulsed spot measurement.
5. Recover from a wait state.

Input level: TTL level, negative or positive edge trigger, or TTL level, negative or positive gate trigger.

Output

An output trigger signal can be sent when one of the following events occurs:

1. The end of a measurement is reached.
2. The end of a measurement at each sweep step for a staircase sweep or multi channel sweep measurement is reached.
3. Completion of the source output setup at each sweep step for a staircase sweep, pulsed sweep, staircase sweep with pulsed bias, or multi-channel sweep measurement.
4. Completion of the pulsed output setup for a pulsed spot measurement.
5. A trigger command is issued.

Output level: TTL level, negative or positive edge trigger, or TTL level, negative or positive gate trigger.

General Purpose Digital I/O

16 general-purpose digital I/O signals are available via a 25-pin DIN connector. These pins can be used as an alternative to the BNC trigger-in and trigger-out lines to synchronize the E5262A and E5263A with other instruments. They can also be used as output and input ports for digital signals. The user can selectively assign pins to trigger mode or digital I/O mode.

Attached Software

A VXI *plug&play* driver is supplied.

Supported operating systems:

Microsoft Windows XP Professional (SP3), Windows Vista Business (SP2, 32 bit), Windows 7 Professional (SP1, 32 bit or 64 bit)

General Specifications

Temperature range

Operating: +5°C to +40°C
Storage: -20°C to +60°C

Humidity range

Operating: 15 % to 80 % RH, non-condensing
Storage: 5 % to 90 % RH, non-condensing

Altitude

Operating: 0 m to 2,000 m (6,561 ft)
Storage: 0 m to 4,600 m (15,092 ft)

Power requirement

ac voltage: 90 V to 264 V
Line frequency: 47 Hz to 63 Hz

Maximum volt-amps (VA)

E5262A: 400 VA
E5263A: 400 VA

Regulatory compliance

EMC: IEC 61326-1:+A1/EN61326-1:+A1
AS/NZS 2064.1
Safety: CSA C22.2 No.1010.1-1992
IEC61010-1:+A2/EN61010-1:+A2
UL3111-1:1994

Certification

CE, CSA, NRTL/C, C-Tick

Dimensions

E5262A and E5263A: 426 mm W x 150 mm H x 575 mm D

Weight

E5262A: 15 kg
E5263A: 16 kg

Furnished accessories

Software CD-ROM (including VXIplug&play driver)

Other Keysight Products

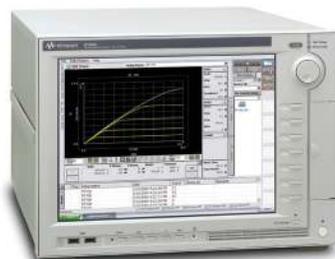
Keysight B2900A Series Precision
Source/Measure Unit
www.keysight.com/find/B2900A



Keysight B1500A Semiconductor
Device Analyzer
www.keysight.com/find/B1500A



Keysight B1505A Power Device
Analyzer/ Curve Tracer (40A/3000V)
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A personalized view into the information most relevant to you.



www.axiestandard.org

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www.lxistandard.org

LAN eXtensions for Instruments puts the power of Ethernet and the Web inside your test systems. Keysight is a founding member of the LXI consortium.



www.pxisa.org

PCI eXtensions for Instrumentation (PXI) modular instrumentation delivers a rugged, PC-based high-performance measurement and automation system.



Three-Year Warranty

www.keysight.com/find/ThreeYearWarranty

Keysight's commitment to superior product quality and lower total cost of ownership. The only test and measurement company with three-year warranty standard on all instruments, worldwide.



Keysight Assurance Plans

www.keysight.com/find/AssurancePlans

Up to five years of protection and no budgetary surprises to ensure your instruments are operating to specification so you can rely on accurate measurements.



www.keysight.com/go/quality

Keysight Technologies, Inc.
DEKRA Certified ISO 9001:2008
Quality Management System

Keysight Channel Partners

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Get the best of both worlds: Keysight's measurement expertise and product breadth, combined with channel partner convenience.

www.keysight.com/find/msmu

For more information on Keysight Technologies' products, applications or services, please contact your local Keysight office. The complete list is available at: www.keysight.com/find/contactus

Americas

| | |
|---------------|------------------|
| Canada | (877) 894 4414 |
| Brazil | 55 11 3351 7010 |
| Mexico | 001 800 254 2440 |
| United States | (800) 829 4444 |

Asia Pacific

| | |
|--------------------|----------------|
| Australia | 1 800 629 485 |
| China | 800 810 0189 |
| Hong Kong | 800 938 693 |
| India | 1 800 112 929 |
| Japan | 0120 (421) 345 |
| Korea | 080 769 0800 |
| Malaysia | 1 800 888 848 |
| Singapore | 1 800 375 8100 |
| Taiwan | 0800 047 866 |
| Other AP Countries | (65) 6375 8100 |

Europe & Middle East

| | |
|----------------|---------------|
| Austria | 0800 001122 |
| Belgium | 0800 58580 |
| Finland | 0800 523252 |
| France | 0805 980333 |
| Germany | 0800 6270999 |
| Ireland | 1800 832700 |
| Israel | 1 809 343051 |
| Italy | 800 599100 |
| Luxembourg | +32 800 58580 |
| Netherlands | 0800 0233200 |
| Russia | 8800 5009286 |
| Spain | 800 000154 |
| Sweden | 0200 882255 |
| Switzerland | 0800 805353 |
| | Opt. 1 (DE) |
| | Opt. 2 (FR) |
| | Opt. 3 (IT) |
| United Kingdom | 0800 0260637 |

For other unlisted countries:
www.keysight.com/find/contactus
(BP-09-23-14)

