Application Overview:
Simplified I/V Characterization of DC-DC Converters

What is a SMU?

Source measure units (SMUs) are an all-in-one solution for current voltage (I/V) characterization with the combined functionality of a precision power supply, high precision DMM, and electronic load. Keithley pioneered the development of individual, compact, bench-top SMU instruments and is the leading supplier of these instruments today.

Testing a DC-DC converter

A DC to DC converter changes a DC voltage level (V_{IN}) to another DC voltage level (V_{OUT}). DC-DC converters are used in a wide variety of devices including cell phones, laptops, and electronic instrumentation. In all these devices, the supplied voltage must be regulated either by stepping up or stepping down the voltage to an internal circuit. Keithley SourceMeter® SMU instruments are perfect for testing such DC-DC Converters:

- All DC I-V testing can be performed using two SMU instruments or one dual-channel SMU instrument as opposed to a rack of equipment.
- SMU instruments can act as a source and load and offer a wide range of current and voltage sourcing and measuring.

Keithley SourceMeter SMU instruments therefore simplify testing as shown in **Figure 1** below.

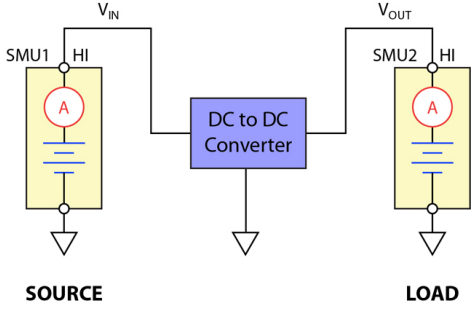


Figure 1: *Circuit diagram showing a dual-channel SMU instrument in use for I/V characterization of a DC-DC converter.*

Common Measurements Made in I/V characterization of DC-DC Converters:

- Load Current (I_L) : The current coming out of the DC-DC converter and going into the SMU instrument acting as a load is the measured load current (I_L). The load current is shown in the I/V curve in **Figure 2.**
- Output Voltage (V_O) The voltage measured at the output of the DC-DC converter is the measured output voltage (V_O). The output voltage is shown in the I/V curve in **Figure 2.**
- Other measurements include: Input Voltage (V_I) • Input Current (I_O) • Efficiency of DC-DC converter $(EFF_{DC\text{-}DC})$

Figure 2 shows an I/V curve of a DC-DC converter generated by using a dual-channel Keithley SourceMeter SMU instrument.

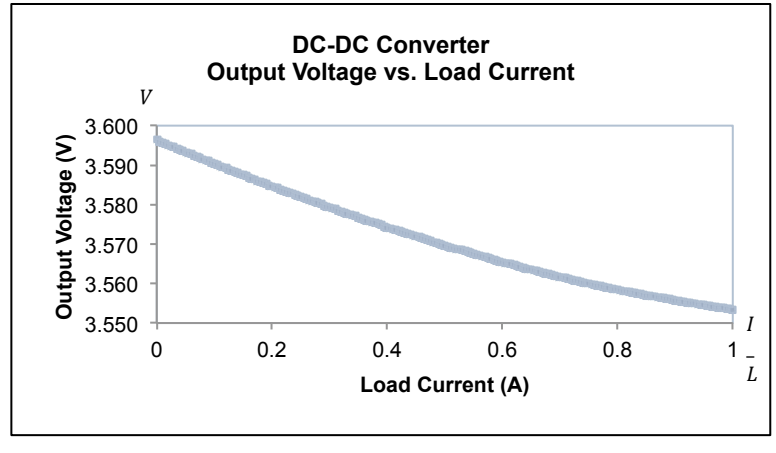


Figure 2: *I/V curve of a DC-DC converter.*

KEITHLEY
A Tektronix Company

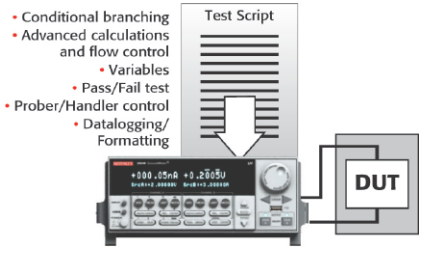
What are Series 2600B SourceMeter SMU Instruments?

The Series 2600B are the industry's leading current/voltage source and measure solutions, and are built from Keithley's 3rd generation SMU technology. The Series 2600B offers single-and dual-channel models that significantly boost productivity in applications ranging from bench-top I/V characterization through highly-automated production test.

Browser-based Testing

The Series 2600B are the only SMU Instruments to feature built-in, Java-based test software that enables true plug & play I/V characterization through any browser, on any computer, from anywhere in the world. Simply connect the Series 2600B instrument to the Internet via the supplied LAN cable, open a browser, type in the Series 2600B instrument's I.P. address, and begin testing. Resulting data can then be exported to a spreadsheet, such as Excel, for further analysis and formatting, or for inclusion in other documents & presentations.

Automated Testing without Control of a PC



For test applications that demand the highest levels of automation and throughput, the Series 2600B's test script processor (TSP®) technology delivers industry-best performance by fully embedding and then executing complete test programs from within the SMU instrument itself. This virtually eliminates all the time-consuming bus communications to and from the PC controller, and thus dramatically improves overall test times.

Key Specifications of the Series 2600B SourceMeter SMU Instruments

Features	2601B / 2611B Single Channel	2602B / 2612B Dual Channel	2604B / 2614B Dual Channel Bench-Top	2634B /2635B / 2636B Low Current Single Channel (2635B) Dual Channel (2634B, 2636B)
# of Channels	1 (optional expansion to 32 via TSP-Link)	2 (optional expansion to 64 via TSP-Link)	2	1 – 2 (optional expansion to 32 or 64 via TSP-Link. Not available for 2634B)
Current Max / Min	10A pulse / 100fA	10A pulse / 100fA	10A pulse / 100 fA	10A pulse / 0.1fA for 2635B 10A pulse / 0.1fA for 2636B 10A pulse/ 1fA for 2634B
Voltage Max / Min	40V / 100nV for 2601B 200V / 100nV for 2611B	40V / 100nV for 2602B 200V / 100nV for 2612B	40V / 100nV for 2604B 200V / 100nV for 2614B	200V / 100nV
Power	30 – 40W	30 – 40W per channel	30 – 40W per channel	30W per channel
Max readings / sec	20,000	20,000	20,000	20,000
Computer Interface	GPIB, LAN (LXI), USB 2.0, RS-232	GPIB, LAN (LXI), USB 2.0, RS-232	GPIB, LAN (LXI), USB 2.0, RS-232	GPIB, LAN (LXI), USB 2.0, RS-232
Connectors/ Cabling	Screw terminal; adaptors available for banana or triax	Screw terminal; adaptors available for banana or triax	Screw terminal; adaptors available for banana or triax	Triax
System-level automation	Digital I/O, TSP-Link, Contact Check	Digital I/O, TSP-Link, Contact Check	Not available	Digital I/O, TSP-Link, Contact Check (not available on 2634B)

For additional information, please refer to Keithley's website at **www.keithley.com** for:

- Detailed Series 2600B specifications
- Application notes
- White papers

For other information, please contact your local applications engineer.

KEITHLEY
A Tektronix Company

Application Overview: Simplified I/V Characterization of LEDs

What is a SMU?

Source measure units (SMUs) are an all-in-one solution for current voltage (I/V) characterization with the combined functionality of a precision power supply, high precision DMM, and electronic load. Keithley pioneered the development of individual, compact, bench-top SMU instruments and is the leading supplier of these instruments today.

Testing a LED

Visible light emitting diodes (LEDs) have a gained a reputation for high efficiency and long lifetimes, which has led to their use in a growing list of applications such as automotive displays and exterior lights, backlighting for televisions and video monitors, street lights, outdoor signs, and interior lighting. Therefore, their accurate and cost-effective testing is critical. Keithley is the industry leader in developing and supporting solutions for electrical testing of LEDs. The figures below illustrate SMUs in different configurations in use for I/V characterization of an LED.

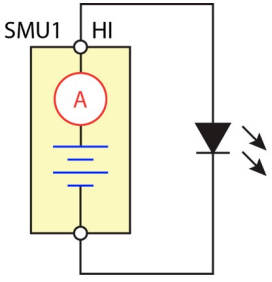


***Figure 1a**: Circuit diagram showing a SMU (Source V, Measure I configuration) in use for I/V characterization of an LED.*

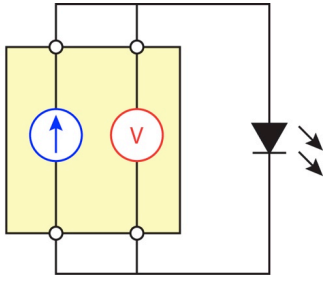


***Figure 1b:** Circuit diagram showing a SMU (Source I, Measure V configuration) in use for I/V **characterization** of an LED.*

Common Measurements Made in I/V Characterization of LEDs

- Forward Voltage Test (V_f) - The forward voltage test is performed by sourcing a known current and measuring the resulting voltage drop across the diode. The results of this test are typically used by manufacturers for binning purposes as the forward voltage is directly related to the chromaticity of the LED.
- Reverse Breakdown Voltage (V_R) - Applying a negative bias current to the LED will allow the measurement of reverse breakdown voltage. This test is performed by sourcing a low-level reverse bias current for a specified time, then measuring the voltage drop across the LED.
- Leakage Current (I_L) - The leakage current test measures the low-level current that leaks across the LED when a reverse voltage less than the breakdown is applied. It is a common practice for leakage measurements and isolation measurements to make sure a certain threshold is not exceeded in production.

These measurements can be seen in the I/V curve of a typical LED shown below in ***Figure 2.***

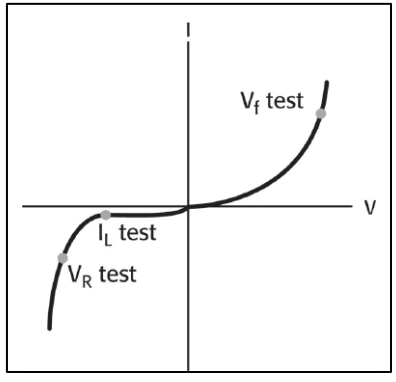


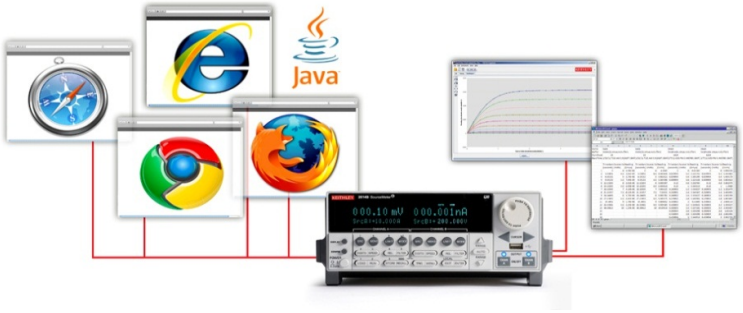
***Figure 2:** I/V curve of a typical LED.*

KEITHLEY
A Tektronix Company

What are Series 2600B SourceMeter® SMU Instruments?

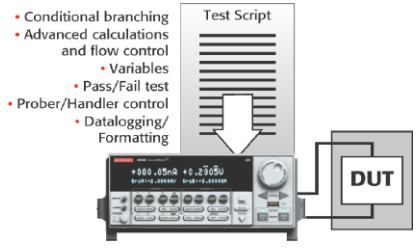
The Series 2600B are the industry's leading current/voltage source and measure solutions, and are built from Keithley's 3rd generation SMU technology. The Series 2600B offers single- and dual-channel models that significantly boost productivity in applications ranging from bench-top I/V characterization through highly-automated production test.

Browser-based Testing



The Series 2600B are the only SMU Instruments to feature built-in, Java-based test software that enables true plug & play I/V characterization through any browser, on any computer, from anywhere in the world. Simply connect the Series 2600B instrument to the Internet via the supplied LAN cable, open a browser, type in the Series 2600B instrument's I.P. address, and begin testing. Resulting data can then be exported to a spreadsheet, such as Excel, for further analysis and formatting, or for inclusion in other documents & presentations.

Automated Testing without Control of a PC



For test applications that demand the highest levels of automation and throughput, the Series 2600B'stest script processor (TSP®) technology delivers industry-best performance by fully embedding and then executing complete test programs from within the SMU instrument itself. This virtually eliminates all the time-consuming bus communications to and from the PC controller, and thus dramatically improves overall test times.

Key Specifications of the Series 2600B SourceMeter SMU Instruments

Features	2601B / 2611B Single Channel	2602B / 2612B Dual Channel	2604B / 2614B Dual Channel Bench-Top	2634B /2635B / 2636B Low Current Single Channel (2635B) Dual Channel (2634B, 2636B)
# of Channels	1 (optional expansion to 32 via TSP-Link)	2 (optional expansion to 64 via TSP-Link.)	2	1 – 2 (optional expansion to 32 or 64 via TSP-Link. Not available for 2634B)
Current Max / Min	10A pulse /100fA	10A pulse /100fA	10A pulse / 100 fA	10A pulse / 0.1fA for 2635B 10A pulse / 0.1fA for 2636B 10A pulse/ 1fA for 2634B
Voltage Max / Min	40V/100nV for 2601B 200V/100nV for 2611B	40V /100nV for 2602B 200V /100nV for 2612B	40V/100nV for 2604B 200V/100nV for 2614B	200V / 100nV
Power	30 – 40W	30 – 40W per channel	30 – 40W per channel	30W per channel
Max readings / sec	20,000	20,000	20,000	20,000
Computer Interface	GPIB, LAN (LXI), USB 2.0, RS-232	GPIB, LAN (LXI), USB 2.0, RS-232	GPIB, LAN (LXI), USB 2.0, RS-232	GPIB, LAN (LXI), USB 2.0, RS-232
Connectors / Cabling	Screw terminal; adaptors available for banana or triax	Screw terminal; adaptors available for banana or triax	Screw terminal; adaptors available for banana or triax	Triax
System-level automation	Digital I/O, TSP-Link, Contact Check	Digital I/O, TSP-Link, Contact Check	Not available	Digital I/O, TSP-Link, Contact Check (not available on 2634B)
Test times for a typical diode test	19 ms vs. 65ms taken by closest competitive SMU= **Over 200% faster test times using a Series 2600B**			

For additional information, please refer to Keithley's website at **www.keithley.com** for:

- Detailed Series 2600B specifications
- Application notes
- White papers

For other information, please contact your local applications engineer.

KEITHLEY
A Tektronix Company

Applications Overview:
Simplified I/V Characterization of Nanotechnology Devices

What is a SMU?

Source measure units (SMUs) are an all-in-one solution for current voltage (I/V) characterization with the combined functionality of a precision power supply, high precision DMM, and electronic load. Keithley pioneered the development of individual, compact, bench-top SMU instruments and is the leading supplier of these instruments today.

Testing a Nanotech Device

Nanotechnology is a broad field involving different types of devices and materials. Many of these tiny structures require I/V tests for electrical characterization. A Carbon nanotube field effect transistor (CNTFET) is a FET that uses a CNT as the conducting channel between the source and drain. Since a CNT FET is a three-terminal device, either two or three SMU instruments are required for electrical characterization as shown in **Figure 1.** Keithley SMU instruments are perfect for nanotech applications and test because:

- They can limit current or voltage to a level low enough to avoid device damage.
- They have the ability to measure and source low current (<1µA).
- They can be easily be synchronized for testing multi-terminal devices.

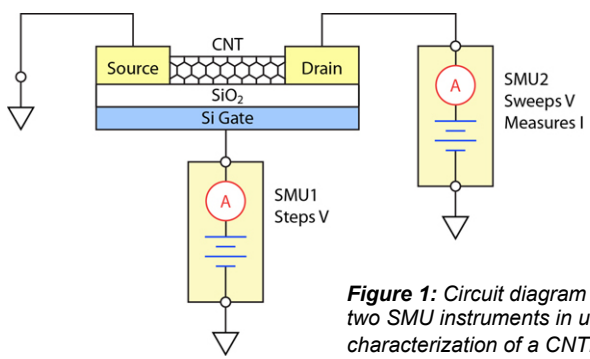


Figure 1: *Circuit diagram showing two SMU instruments in use for I/V characterization of a CNTFET.*

Common Measurements Made in I/V Characterization of CNTFETs:

- Drain Current (I_D): The current taken from the voltage source by the drain terminal is called the drain current. Drain current can yield a lot of insight on the device's operation and efficiency.
- Drain Voltage (V_D): The voltage measured at the drain terminal of a CNTFET is the drain voltage.
  Drain current and drain voltage can yield a lot of insight on the CNTFET's operation and efficiency.
- Other measurements include:
  - Gate Voltage (V_G) • Threshold Voltage (V_{TH}) • Gate Current (I_G)

Figure 2 shows a CNTFET family of I/V curves generated by using two Keithley SourceMeter SMU instruments.

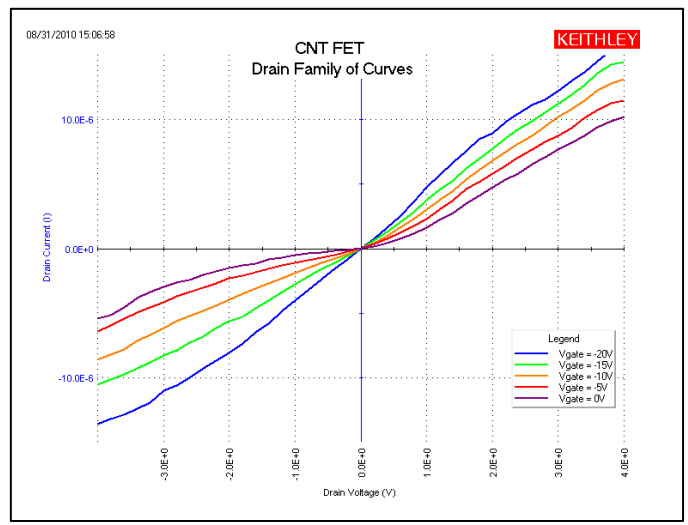


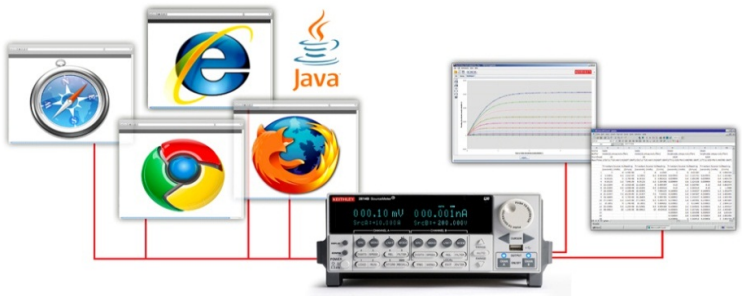
Figure 2: *I/V curve of a CNTFET.*

KEITHLEY
A Tektronix Company

What are Series 2600B SourceMeter SMU Instruments?

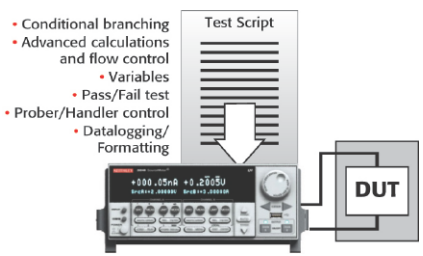
The Series 2600B are the industry's leading current/voltage source and measure solutions, and are built from Keithley's 3rd generation SMU technology. The Series 2600B offers single-and dual-channel models that significantly boost productivity in applications ranging from bench-top I/V characterization through highly-automated production test.

Browser-based Testing



The Series 2600B are the only SMU Instruments to feature built-in, Java-based test software that enables true plug & play I/V characterization through any browser, on any computer, from anywhere in the world. Simply connect the Series 2600B instrument to the Internet via the supplied LAN cable, open a browser, type in the Series 2600B instrument's I.P. address, and begin testing. Resulting data can then be exported to a spreadsheet, such as Excel, for further analysis and formatting, or for inclusion in other documents & presentations.

Automated Testing without Control of a PC



For test applications that demand the highest levels of automation and throughput, the Series 2600B's test script processor (TSP®) technology delivers industry-best performance by fully embedding and then executing complete test programs from within the SMU instrument itself. This virtually eliminates all the time-consuming bus communications to and from the PC controller, and thus dramatically improves overall test times.

Key Specifications of the Series 2600B SourceMeter SMU Instruments

Features	2601B / 2611B Single Channel	2602B / 2612B Dual Channel	2604B / 2614B Dual Channel Bench-Top	2634B /2635B / 2636B Low Current Single Channel (2635B) Dual Channel (2634B, 2636B)
# of Channels	1 (optional expansion to 32 via TSP-Link)	2 (optional expansion to 64 via TSP-Link)	2	1 – 2 (optional expansion to 32 or 64 via TSP-Link. Not available for 2634B)
Current Max / Min	10A pulse / 100fA	10A pulse / 100fA	10A pulse / 100 fA	10A pulse / 0.1fA for 2635B 10A pulse / 0.1fA for 2636B 10A pulse/ 1fA for 2634B
Voltage Max / Min	40V / 100nV for 2601B 200V / 100nV for 2611B	40V / 100nV for 2602B 200V / 100nV for 2612B	40V / 100nV for 2604B 200V / 100nV for 2614B	200V / 100nV
Power	30 – 40W	30 – 40W per channel	30 – 40W per channel	30W per channel
Max readings / sec	20,000	20,000	20,000	20,000
Computer Interface	GPIB, LAN (LXI), USB 2.0, RS-232	GPIB, LAN (LXI), USB 2.0, RS-232	GPIB, LAN (LXI), USB 2.0, RS-232	GPIB, LAN (LXI), USB 2.0, RS-232
Connectors/ Cabling	Screw terminal; adaptors available for banana or triax	Screw terminal; adaptors available for banana or triax	Screw terminal; adaptors available for banana or triax	Triax
System-level automation	Digital I/O, TSP-Link, Contact Check	Digital I/O, TSP-Link, Contact Check	Not available	Digital I/O, TSP-Link, Contact Check (not available on 2634B)

For additional information, please refer to Keithley's website at **www.keithley.com** for:

- Detailed Series 2600B specifications
- Application notes
- White papers

For other information, please contact your local applications engineer.

KEITHLEY
A Tektronix Company

Application Overview: Simplified I/V Characterization of Solar Cells

What is a SMU?

Source measure units (SMUs) are an all-in-one solution for current voltage (I/V) characterization with the combined functionality of a precision power supply, high precision DMM, and electronic load. Keithley pioneered the development of individual, compact, bench-top SMU instruments and is the leading supplier of these instruments today.

Testing a Solar Cell

A major focus of solar cell researchers and users is improving cell efficiency and maximizing energy extraction. This requires I/V measurements to characterize performance of a solar cell. Keithley's SourceMeter® SMU Instruments are the industry standard for photovoltaic I/V characterization. They are ideal for solar cell testing because:

- They have the ability to act as a sink.
- They can act as a high precision electronic load.
- They provide the industry's widest dynamic range and have high and low current capability.

Figure 1 below shows a SMU instrument in use for I/V characterization of a solar cell.

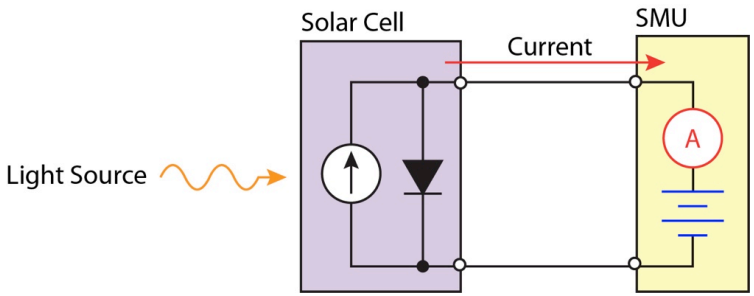


Figure 1: *Circuit diagram showing a SMU in use for I/V characterization of a solar cell.*

Common Measurements Made in I/V Characterization of Solar Cells

- Open Circuit Voltage (V_{OC}) - The open-circuit voltage (V_{OC}) is the maximum voltage available from a solar cell, and this occurs at zero current. The open-circuit voltage is shown on the IV curve below.
- Short Circuit Current (I_{SC}) - The short-circuit current is the current through the solar cell when the voltage across the solar cell is zero (i.e., when the solar cell is short circuited). The short circuit current is shown on the IV curve below.
- Other common measurements include:
  - Shunt resistance (R_{SH}) • Conversion efficiency (η)
  - Maximum power output (P_{max}) • Voltage at Pmax (V_{max})
  - Resistivity • Fill factor (ff) • Series resistance (R_s)

Dark I/V measurements are commonly used to analyze the electrical characteristics of solar cells. Dark I/V measurements are more sensitive than light I/V measurements in determining parameters such as series resistance, shunt resistance, diode factor, and diode saturation currents. The I/V curves of a dark and illuminated cell obtained using a Keithley SMU instrument is shown in **Figure 2.**

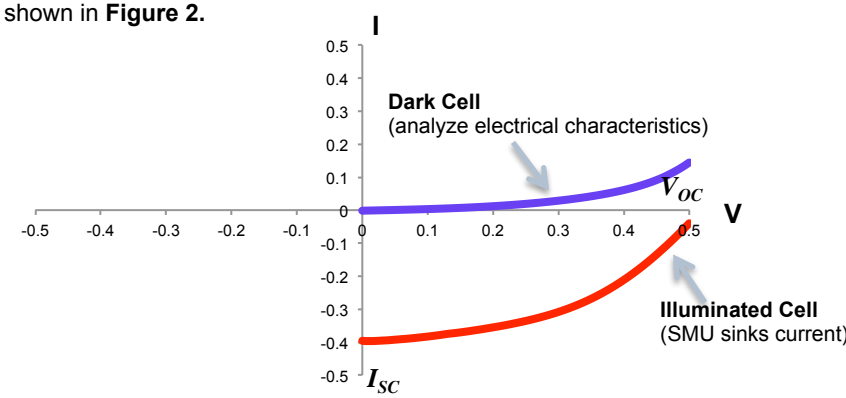


Figure 2: *I/V curve of a solar cell.*

KEITHLEY
A Tektronix Company

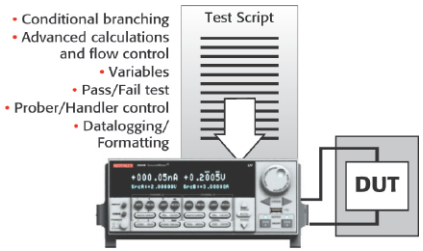
What are Series 2600B SourceMeter SMU Instruments?

The Series 2600B are the industry's leading current/voltage source and measure solutions, and are built from Keithley's 3rd generation SMU technology. The Series 2600B offers single-and dual-channel models that significantly boost productivity in applications ranging from bench-top I/V characterization through highly-automated production test.

Browser-based Testing

The Series 2600B are the only SMU Instruments to feature built-in, Java-based test software that enables true plug & play I/V characterization through any browser, on any computer, from anywhere in the world. Simply connect the Series 2600B instrument to the Internet via the supplied LAN cable, open a browser, type in the Series 2600B instrument's I.P. address, and begin testing. Resulting data can then be exported to a spreadsheet, such as Excel, for further analysis and formatting, or for inclusion in other documents & presentations.

Automated Testing without Control of a PC



For test applications that demand the highest levels of automation and throughput, the Series 2600B's test script processor (TSP®) technology delivers industry-best performance by fully embedding and then executing complete test programs from within the SMU instrument itself. This virtually eliminates all the time-consuming bus communications to and from the PC controller, and thus dramatically improves overall test times.

Key Specifications of the Series 2600B SourceMeter SMU Instruments

Features	2601B / 2611B Single Channel	2602B / 2612B Dual Channel	2604B / 2614B Dual Channel Bench-Top	2634B /2635B / 2636B Low Current Single Channel (2635B) Dual Channel (2634B, 2636B)
# of Channels	1 (optional expansion to 32 via TSP-Link)	2 (optional expansion to 64 via TSP-Link)	2	1 – 2 (optional expansion to 32 or 64 via TSP-Link. Not available for 2634B)
Current Max / Min	10A pulse / 100fA	10A pulse / 100fA	10A pulse / 100 fA	10A pulse / 0.1fA for 2635B 10A pulse / 0.1fA for 2636B 10A pulse/ 1fA for 2634B
Voltage Max / Min	40V / 100nV for 2601B 200V / 100nV for 2611B	40V / 100nV for 2602B 200V / 100nV for 2612B	40V / 100nV for 2604B 200V / 100nV for 2614B	200V / 100nV
Power	30 – 40W	30 – 40W per channel	30 – 40W per channel	30W per channel
Max readings / sec	20,000	20,000	20,000	20,000
Computer Interface	GPIB, LAN (LXI), USB 2.0, RS-232	GPIB, LAN (LXI), USB 2.0, RS-232	GPIB, LAN (LXI), USB 2.0, RS-232	GPIB, LAN (LXI), USB 2.0, RS-232
Connectors/ Cabling	Screw terminal; adaptors available for banana or triax	Screw terminal; adaptors available for banana or triax	Screw terminal; adaptors available for banana or triax	Triax
System-level automation	Digital I/O, TSP-Link, Contact Check	Digital I/O, TSP-Link, Contact Check	Not available	Digital I/O, TSP-Link, Contact Check (not available on 2634B)

For additional information, please refer to Keithley's website at **www.keithley.com** for:

- Detailed Series 2600B specifications
- Application notes
- White papers

For other information, please contact your local applications engineer.

KEITHLEY
A Tektronix Company

Application Overview: Simplified I/V Characterization of Transistors

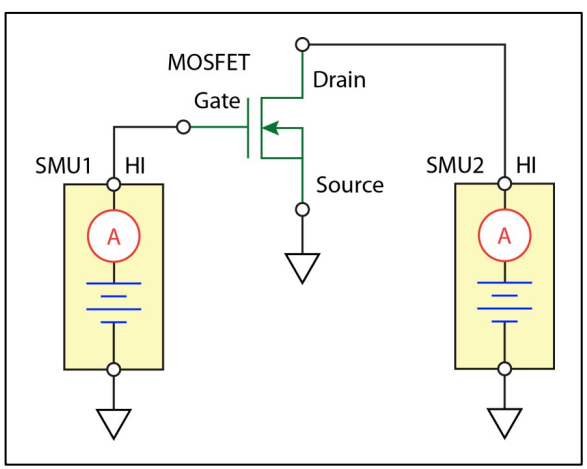
What is a SMU?

Source measure units (SMUs) are an all-in-one solution for current voltage (I/V) characterization with the combined functionality of a precision power supply, high precision DMM, and electronic load. Keithley pioneered the development of individual, compact, bench-top SMU instruments and is the leading supplier of these instruments today.

Testing a Transistor

Semiconductor devices (e.g., transistors) are the foundation of electronic products. Most devices need to be electrically characterized in various settings of the research and development process: research labs, fabs, universities, device manufacturers, etc. Keithley is the industry leader in I/V characterization of transistors. Using Keithley SourceMeter® SMU instruments for semiconductor characterization is ideal because of their ability to both source and measure, especially low currents. Testing devices that have more than two terminals usually requires more than one SMU. However, a two-channel SMU can perform most characterizations on a single field effect transistor (FET). **Figure 1** below shows two SMUs in use for I/V characterization of a MOSFET.

Figure 1: *Circuit diagram showing a two-channel SMU in use for I/V characterization of a MOSFET.*



Common Measurements Made in I/V Characterization of Transistors

- Drain Voltage (V_D) - The voltage appearing at the drain terminal of a field-effect transistor is called the drain voltage.
- Drain Current (I_D) - The current taken from the voltage source by the drain terminal is called the drain current. Drain current can yield a lot of insight on the device's operation and efficiency.
- Other common measurements include:

  Gate Voltage (V_G) • Gate Current (I_G) • Threshold Voltage (V_{TH})

Figure 2 shows a MOSFET drain family of curves generated by using a dual-channel Keithley SourceMeter SMU instrument.

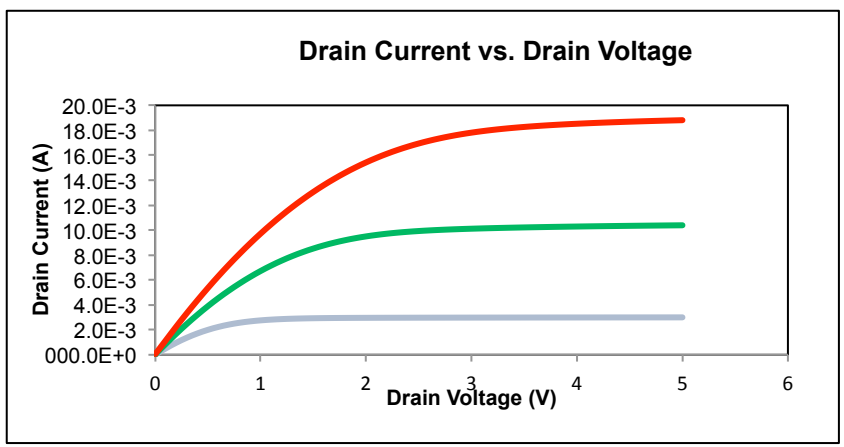


Figure 2: *I/V curve of a MOSFET.*

KEITHLEY
A Tektronix Company

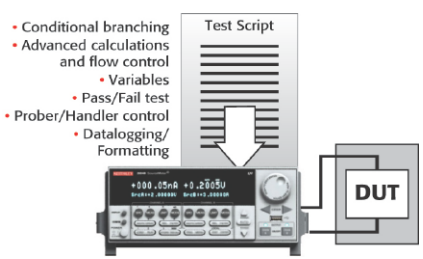
What are Series 2600B SourceMeter SMU Instruments?

The Series 2600B are the industry's leading current/voltage source and measure solutions, and are built from Keithley's 3rd generation SMU technology. The Series 2600B offers single-and dual-channel models that significantly boost productivity in applications ranging from bench-top I/V characterization through highly-automated production test.

Browser-based Testing

The Series 2600B are the only SMU Instruments to feature built-in, Java-based test software that enables true plug & play I/V characterization through any browser, on any computer, from anywhere in the world. Simply connect the Series 2600B instrument to the Internet via the supplied LAN cable, open a browser, type in the Series 2600B instrument's I.P. address, and begin testing. Resulting data can then be exported to a spreadsheet, such as Excel, for further analysis and formatting, or for inclusion in other documents & presentations.

Automated Testing without Control of a PC



For test applications that demand the highest levels of automation and throughput, the Series 2600B's test script processor (TSP®) technology delivers industry-best performance by fully embedding and then executing complete test programs from within the SMU instrument itself. This virtually eliminates all the time-consuming bus communications to and from the PC controller, and thus dramatically improves overall test times.

Key Specifications of the Series 2600B SourceMeter SMU Instruments

Features	2601B / 2611B Single Channel	2602B / 2612B Dual Channel	2604B / 2614B Dual Channel Bench-Top	2634B /2635B / 2636B Low Current Single Channel (2635B) Dual Channel (2634B, 2636B)
# of Channels	1 (optional expansion to 32 via TSP-Link)	2 (optional expansion to 64 via TSP-Link)	2	1 – 2 (optional expansion to 32 or 64 via TSP-Link. Not available for 2634B)
Current Max / Min	10A pulse / 100fA	10A pulse / 100fA	10A pulse / 100 fA	10A pulse / 0.1fA for 2635B 10A pulse / 0.1fA for 2636B 10A pulse/ 1fA for 2634B
Voltage Max / Min	40V / 100nV for 2601B 200V / 100nV for 2611B	40V / 100nV for 2602B 200V / 100nV for 2612B	40V / 100nV for 2604B 200V / 100nV for 2614B	200V / 100nV
Power	30 – 40W	30 – 40W per channel	30 – 40W per channel	30W per channel
Max readings / sec	20,000	20,000	20,000	20,000
Computer Interface	GPIB, LAN (LXI), USB 2.0, RS-232	GPIB, LAN (LXI), USB 2.0, RS-232	GPIB, LAN (LXI), USB 2.0, RS-232	GPIB, LAN (LXI), USB 2.0, RS-232
Connectors/ Cabling	Screw terminal; adaptors available for banana or triax	Screw terminal; adaptors available for banana or triax	Screw terminal; adaptors available for banana or triax	Triax
System-level automation	Digital I/O, TSP-Link, Contact Check	Digital I/O, TSP-Link, Contact Check	Not available	Digital I/O, TSP-Link, Contact Check (not available on 2634B)

For additional information, please refer to Keithley's website at **www.keithley.com** for:

- Detailed Series 2600B specifications
- Application notes
- White papers

For other information, please contact your local applications engineer.

KEITHLEY
A Tektronix Company