TECHNICAL DATA SHEET

VXI Instruments
the test solutions provider

AXV7680
High Voltage SMU



LAN
USB

Features

- High Voltage Source with programmable Current Limits: multiple ranges available, with output up to 10 000 V and 200 mA.
- Versatile Current Measurement: dynamic range from 200 mA down to picoampere resolution for high precision measurement, especially valuable for detecting leakage currents in semiconductors.
- Enhanced Testing Efficiency: the bipolar MOSFET power amplifier with a programmable slew rate up to 1000 V/ms enables efficient and precise testing of components.
- High Power Capacity: expanding testing capabilities with 200 W DC power and pulsed power up to 750 W, ideal for power-intensive applications.
- Increased Accuracy: Integrated 6-wire technology improves measurement accuracy and accelerates test speeds.
- Integrated Digitizer Circuitry: operates simultaneously with all measurement units at up to 1 MS/s, enabling the device to function as an internal oscilloscope for detailed signal evaluation.
- Comprehensive Diagnostics: the integrated output matrix offers self-test capabilities, ensuring system integrity and making troubleshooting simpler and faster.
- Safety Assurance: the built-in short circuit protection safeguards all high-voltage outputs (FORCE, SENSE, GUARD) and monitor outputs.
- Engineered for Fast Semiconductor Testing: designed for high-speed, versatile, and precise testing of semiconductors.

Product Information

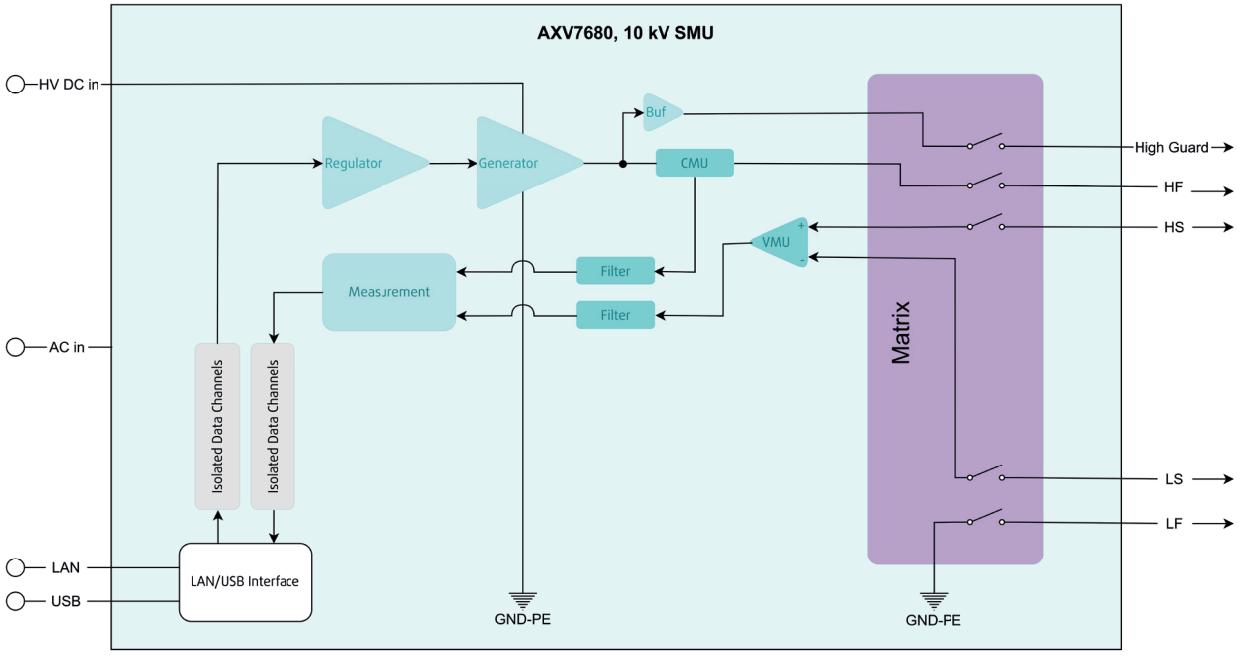
The AXV7680 High Voltage SMU is engineered for fast semiconductor testing, providing versatile functionalities and exceptional precision. This advanced device operates as a voltage source with programmable current limits, maximizing test throughput with its sophisticated features.

The AXV7680 incorporates a bipolar MOSFET power amplifier with a programmable slew rate of up to 1000 V/ms, facilitating fast and efficient testing. It offers multiple generator ranges up to 10 000 V. A versatile current measurement dynamic can be achieved through its many, fast selectable current ranges. This setup enables the AXV7680 to get high current measurements from 200 mA down to picoampere resolution in its most precise configuration. This comprehensive range of measurements ensures the device meets all high voltage semiconductor testing requirements with high accuracy, especially valuable for detecting leakage currents in semiconductors.
With 200 W DC power and a pulsed power up to 750 W, the device can handle power intense applications and expanding testing capabilities.

The integrated digitizer circuitry also works simultaneously with all measurement units of up to 1MS/s over their full range. This high sampling rate allows the AXV7680 to work as an internal oscilloscope, providing detailed evaluation of measured signals.
The device features integrated 6-wire technology to increase measurement accuracy and enables very fast test speed, providing reliable results much faster.

The device includes an integrated output matrix and self-test capability, ensuring system integrity and making troubleshooting simpler and faster.
To ensure the safety and integrity of testing, all high voltage outputs (FORCE, SENSE, GUARD) and monitor outputs are short circuit protected. The AXV7680 High Voltage SMU is a vital tool for professionals requiring precision, efficiency, and reliability in semiconductor testing, making it ideal for a wide range of high voltage applications.
Specifically designed for high-speed, versatile, and precise semiconductor testing, reducing testing time and increasing throughput for customers.

These features provide customers with a robust, accurate, and efficient testing solution that supports advanced diagnostics and ensures safety, ultimately lowering testing time and improving productivity.



General Specification

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AC line voltage	80 ... 305 V for main SMU, 203 V ... 230 V for auxiliary Heinzinger PSU
AC line frequency	47 Hz ... 63 Hz
Power consumption	500 W under full load
AC line voltage fuse	2 x 2.5 A medium or slow blowing fuse
Operating temperature	20 ... 26 °C (Limited continuous output power when operated above 23 °C)
Operating altitude	<2 000 m
Operating environment	Device must only be operated in clean room environment, ISO 14644-1, Class ISO 7 or better.
Relative humidity	Max 60 %
Storage temperature range	-25 ... 70 °C
Size	19'', 6HE, 84TE (inclusive external HV PSU), depth: 595 mm without handles, 655 mm with handles

Generator Voltage Source

Voltage Source, Generator	Specification	Comment
DC Accuracy		
Range 2.5 kV	0.5 % of full range	
Range 5 kV	0.25 % of full range	
Range 10 kV[1]	0.1 % of full range	
Continuous output current		As long as power limitations do not apply, see manual section 8.4
Range 2.5 kV	max. 80 mA	
Range 5 kV	max. 40 mA	
Range 10 kV[1]	max. 20 mA	
Pulsed output current		As long as power limitations do not apply, see manual section 8.4; Longer durations are possible with less programmed current
Range 2.5 kV	max. 200 mA for 12 ms	
Range 5 kV	max. 150 mA for 8 ms	
Range 10 kV[1]	max. 75 mA for 8 ms	
Output Voltage Slewrate	100 ... 1 000 V/ms	

Generator Current Source

Current Source, Generator	Specification	Comment
Output current		
Range: 100 µA	10 µA ... 100 µA	
Range: 1 mA	100 µA ... 1 mA	
Range: 10 mA	1 mA ... 10 mA	
Range: 100 mA	10 mA ... 100 mA	
Range: 200 mA	20 mA ... 200 mA	
DC Accuracy	0.5 % of full range	For all ranges
Current Limit Application Delay	max 1 ms[2]	

[1] The 10 kV range has an actual max value of 9000 V. This will most likely change with later releases.

[2] When going from voltage-limitation mode to current-limiting, there is a delay until the current limiting regulator is fully active. In this time period the current is allowed to spike higher than normal.

Output Power

Output Power	Specification	Comment
Continuous Output Power	200 W	When operating at 23 °C ambient temperature or below. If ambient temperature rises above 23 °C continuous output power shall be reduced to 150 W after 10 minutes.
Pulse Output power Range: 2.5 kV Range: 5 kV Range: 10 kV	 500 W 750 W 750 W	Range 2.5 k: Limited by max pulse current
Maximum energy per single pulse	6 J	Additional information see manual section 7.2. Maximum energy can only be achieved when output voltage is at its range maximum.

Voltage and Current Measurement Unit

Voltage Measurement Unit	Specification
Resolution	24 Bit
Selectable Ranges	100 V, 1 kV, 10 kV
Overrange	10 % min
DC accuracy[1]	0.1 % typ. (full scale)
Selectable cut-off filter frequencys	100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 GHz
Conversion Time for Single Measurements	4 µs
Conversion Time for Interval Measurements	1 µs ... 100 µs
Number of Cached Points for Interval Measurements	4 ... 1000

Current Measurement Unit	Specification
Resolution	24 Bit
Selectable Ranges	1 µA, 10 µA, 100 µA, 1 mA, 10 mA, 100 mA, 200 mA
Overrange	10 % min
DC accuracy[2]	0.25 % typ. (full scale)
Selectable cut-off filter frequencies	100 Hz, 1 kHz, 10 kHz, 100 kHz, 1 GHz
Conversion Time for Single Measurements	4 µs
Conversion Time for Interval Measurements	1 µs ... 100 µs
Number of Cached Points for Interval Measurements	4 ... 1000
Selectable Series Resistors[3]	0 Ω, 100 Ω, 1 kΩ, 10 kΩ

[1] Specification tested and approved with averaging over 100 ms. Filter was set to 1 kHz.

[2] Specification tested and approved with averaging over 20 ms. Filter was set to 1 kHz.

[3] If a resistor other than 0 Ω is selected, the voltage produced over this resistor must not be greater than 4 V. Otherwise the voltage and current measurements of CMU and VMU are invalid.

Ordering Information

On Request
GPIB Interface
USB Interface
ePCIe Interface

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