High-Power SMU Family

VCS is a series of high-power SMUs designed for sourcing and measuring up to 400A and 1200V. The modular architecture allows connecting more than one SMU to a single control bus and extend the total channel density. All SMU channels are fully independent and equipped with sourcing and measuring sub-channels, enabling to source and measure voltage and/or current simultaneously.

The sampling rate and the resolution of each measuring sub-01 channel are 1 MHz and 16 bit, which enables to monitor both static and dynamic processes.

The VCS family SMUs are optimized for integrating in ATE systems designed for testing high power semiconductor devices on the production. These SMUs can be also used as a standalone benchtop instruments.

Features

- Connecting more than one SMU to a single chassis
- Trigger lines for hardware synchronization of SMUs connected to the single chassis
- Event signals exporting
- Source and measurement of current and voltage
- Simultaneous sourcing and measurement in static as well as in dynamic mode
- Measurement sub-channel sampling rate of up to 1 MHz
- All channels are fully independent from each other
- VI curve capture mode
- Compatible with LabVIEW 2022
- Operating system Windows 10/11
- Chassis with 12 slots
- L x W x H : 600mm x 520mm x 344mm
- Protection Rating: IP20
- Complies With: IEC 60297-3-100

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VCS1200-0.05 SMU

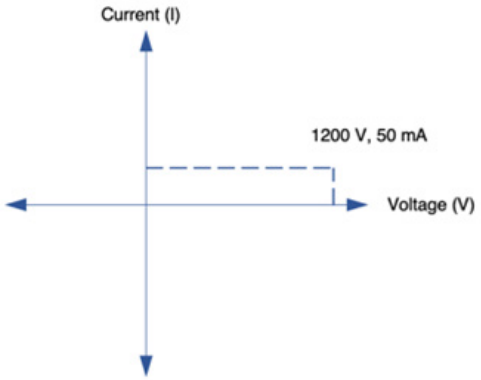
VCS1200-0.05 High Voltage Current and Voltage Meter

Purpose

The VCS1200-0.05 high voltage and current source-meter with (hereinafter referred to as the module) is used as part of the Gamma TSSemi high power semiconductor testers and is designed to set stable DC voltage and DC current values and measure set values.

Features

- High accuracy
- High resolution
- High-speed sampling rate up to 1 MS/s
- Parallel voltage and current measurement
- Force mode
- Pulse Mode Only (up to 500ms)
- Bandwidth selection (8 positions)
- Compatible with LabVIEW 2020
- Operating system Windows 10
- Interface USB 2
- Power 48 V
- L x W x H : 423.6 mm x 42.5 mm x 233.5 mm



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VCS1200-0.05 SMU

Specifications

Electrical parameters of the VCS1200-0.5 source-measuring device

Parameter	Value
Voltage ranges (pulse mode)	300 V, 600 V, 1200 V
Current ranges (pulse mode)	5 uA, 50 uA, 500 uA, 5 mA, 50 mA
Accuracy of setting and measuring the current (KR)	± (0.5% of value + 0.5% of range)
Accuracy of setting and measuring the voltage (KR)	± (0.5% of value + 0.5% of range)
Maximum duration of voltage and current output pulse	500 ms (meander)
Maximum output current	50 mA
Maximum sampling rate for voltage and current measurements	400 kSa/s

Operating Characteristics

Parameter	Value
Max. Output Power	60 W - pulse, 6 W – average
Source Limits	Vsource: ±1200 V (≤ 50 mA range) Isource: ±50 mA (≤1200 V range)
Overrange	105% of range, source and measure
Output Settling Time	Time required to reach 0.1% of final value, 20 V range, 50 mA I-Limit: <200 µs typical
Maximum Slew Rate	2 V/µs, 200 V range, 50 mA limit into a 2 kΩ load (typical)
Voltage Source Noise	10 Hz – 1 MHz (RMS): 2 mV typical into a resistive load
Max. Voltage Drop Between Force and Sense Terminals	1 V
Sense Input Impedance	>1 GΩ

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VCS1200-0.05 SMU

Voltage source specifications

Range	Resolution	Accuracy
300 V	4.6 mV	± (0.5% of value + 0.5% of range)
600 V	9.1 mV	± (0.5% of value + 0.5% of range)
1200 V	18.3 mv	± (0.5% of value + 0.5% of range)

Voltage measure specifications

Range	Resolution	Accuracy
300 V	4.6 mV	± (0.5% of value + 0.5% of range)
600 V	9.1 mV	± (0.5% of value + 0.5% of range)
1200 V	18.3 mv	± (0.5% of value + 0.5% of range)

Current source specifications

Range	Resolution	Accuracy
5 uA	0.07 nA	± (0.5% of value + 0.5% of range)
50 uA	0.76 nA	± (0.5% of value + 0.5% of range)
500 uA	7.6 nA	± (0.5% of value + 0.5% of range)
5 uA	76.3 nA	± (0.5% of value + 0.5% of range)
50 uA	763 nA	± (0.5% of value + 0.5% of range)

Current measure specifications

Range	Resolution	Accuracy
5 uA	0.07nA	± (0.5% of value + 0.5% of range)
50 uA	0.76nA	± (0.5% of value + 0.5% of range)
500 uA	7.6nA	± (0.5% of value + 0.5% of range)
5 mA	76.3nA	± (0.5% of value + 0.5% of range)
50 mA	763nA	± (0.5% of value + 0.5% of range)

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VCS60-400N SMU

VCS60-400N Negative Voltage and Current Source-Meter with Large Output Current

Purpose

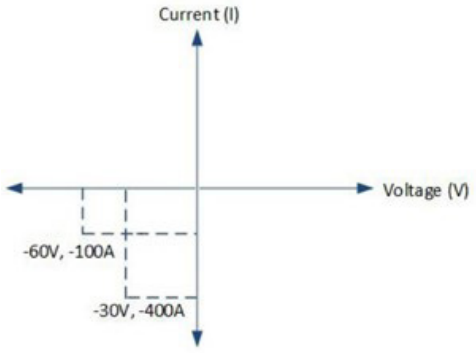
The VCS60-400N positive voltage and current source-meter with high output current (hereinafter referred to as the module) is used as part of the Gamma TSSemi high power semiconductor testers and is designed to set stable DC voltage and DC current values and measure set values.

Features

- High accuracy
- High resolution
- 2 region operation:

  -30 V, -400 A (pulse mode)

  -60 V, -100 A (pulse mode)
- High-speed sampling rate up to 1 MS/s
- Parallel voltage and current measurement
- Bandwidth selection (eight positions)
- Compatible with LabVIEW 2020
- Operating system Windows 10
- Interface USB 2
- L x W x H : 414.6 mm x 56.3 mm x 233.5 mm



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VCS60-400N SMU

Electrical parameters of the VCS60-400N source-measuring device

Parameter	Value
Voltage ranges (pulse mode)	-3 V, -10 V, -30 V, -60 V
Current ranges (pulse mode)	10 A, 100 A, 400 A
Accuracy of setting and measuring the current	± (0.6% of value + 0.5% of range)
Accuracy of setting and measuring the voltage	± (0.6% of value + 0.5% of range)
Maximum duration of voltage and current output pulse	400A (500uS 0.5% duty cycle max)
Maximum output current	100 A to 60 V 400 A to 30 V
Maximum sampling rate for voltage and current measurements	400 kSa/s

Operating Characteristics

Parameter	Value
Max. Output Power	6 kW – pulse (100 A), 12 kW (400) - pulse
Source Limits	Vsource: -30 V (≤400 A range), -60 V (≤100 A) Isource: 400 A (≤-30 V range), 100 A (-60 V)
Overrange	105% of range, source and measure
Resolution	Voltage: ± (0.6% of value + 0.5% of range) Current: ± (0.6% of value + 0.5% of range)
Output Settling Time	Time required to reach 0.1% of final value, 20 V range, 100 mA I-Limit: <200 µs typical
Maximum Slew Rate	2 V/µs, 60 V range, 50 mA limit into a 2 kΩ load (typical)
Voltage Source Noise	10 Hz – 1 MHz (RMS): 2 mV typical into a resistive load
Max. Voltage Drop Between Force and Sense Terminals	1 V
Max. Sense Lead Resistance	1 MΩ for rated accuracy

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VCS60-400N SMU

Voltage source specifications

Range	Resolution	Accuracy
-3 V	-0.045mV	± (0.6% of value + 0.5% of range)
-10 V	-0.15 mV	± (0.6% of value + 0.5% of range)
-30 V	-0.45 mV	± (0.6% of value + 0.5% of range)
-60 V	-0.91 mV	± (0.6% of value + 0.5% of range)

Voltage measure specifications

Range	Resolution	Accuracy
-3V	-0.045mV	± (0.6% of value + 0.5% of range)
-10V	-0.15mV	± (0.6% of value + 0.5% of range)
-30V	-0.45mV	± (0.6% of value + 0.5% of range)
-60V	-0.91mV	± (0.6% of value + 0.5% of range)

Current source specifications

Range	Resolution	Accuracy
10 A	0.152 mA	± (0.6% of value + 0.5% of range)
100 A	1.52 mA	± (0.6% of value + 0.5% of range)
400 A	6.1 mA	± (0.6% of value + 0.5% of range)

Current measure specifications

Range	Resolution	Accuracy
10 A	0.152 mA	± (0.6% of value + 0.5% of range)
100 A	1.52 mA	± (0.6% of value + 0.5% of range)
400 A	6.1 mA	± (0.6% of value + 0.5% of range)

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VCS60-400P SMU

VCS60-400P Positive Voltage and Current Source-Meter with Large Output Current

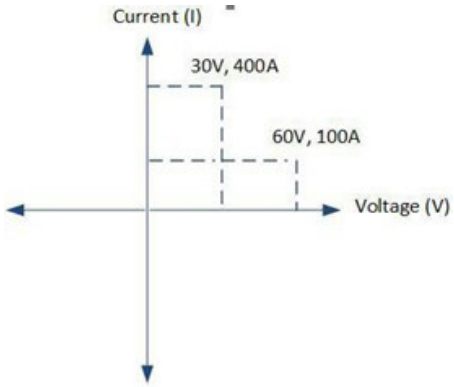
The VCS60-400P positive voltage and current source-meter with high output current (hereinafter referred to as the module) is used as part of the Gamma TSSemi high power semiconductor testers and is designed to set stable DC voltage and DC current values and measure set values.

Features

- High accuracy
- High resolution
- 2 region operation:

  +30 V, +400 A (pulse mode)

  +60 V, +100 A (pulse mode)
- High-speed sampling rate up to 1 MS/s
- Parallel voltage and current measurement
- Bandwidth selection (eight positions)
- Compatible with LabVIEW 2020
- Operating system Windows 10
- Interface USB 2
- L x W x H : 414.6 mm x 56.3 mm x 233.5 mm



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VCS60-400P SMU

Electrical parameters of the VCS60-400P source-measuring device

Source-meter VCS60-400P	
Voltage ranges (pulse mode)	+3 V, +10 V, +30 V, +60 V
Current ranges (pulse mode)	10 A, 100 A, 400 A
Accuracy of setting and measuring the current (KR)	± (0.6% of value + 0.5% of range)
Accuracy of setting and measuring the voltage (KR)	± (0.6% of value + 0.5% of range)
Maximum duration of voltage and current output pulse	400A (500uS 0.5% duty cycle max)
Maximum output current	100 A to 60 V 400 A to 30 V
Maximum sampling rate for voltage and current measurements	400 kSa/s

Operating Characteristics

Parameter	**Value**
Max. Output Power	6 kW – pulse (100 A), 12 kW (400) - pulse
Source Limits	Vsource: 30 V (≤400 A range), 60 V (≤100 A) Isource: 400 A (≤30 V range), 100 A (60 V)
Overrange	105% of range, source and measure
Resolution	Voltage: ± (0.6% of value + 0.5% of range)
Output Settling Time	Current: ± (0.6% of value + 0.5% of range)
Maximum Slew Rate	Time required to reach 0.1% of final value, 20 V range, 100 mA I-Limit: <200 µs typical
Voltage Source Noise	2 V/µs, 60 V range, 50 mA limit into a 2 kΩ load (typical)
Max. Voltage Drop Between	10 Hz – 1 MHz (RMS): 2 mV typical into a resistive load
Force and Sense Terminals	1 V
Max. Sense Lead Resistance	1 MΩ for rated accuracy

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VCS60-400P SMU

Voltage source specifications

Range	Resolution	Accuracy
3 V	0.045mV	± (0.6% of value + 0.5% of range)
10 V	0.15 mV	± (0.6% of value + 0.5% of range)
30 V	0.45 mV	± (0.6% of value + 0.5% of range)
60 V	0.91 mV	± (0.6% of value + 0.5% of range)

Voltage measure specifications

Range	Resolution	Accuracy
3 V	0.045mV	± (0.6% of value + 0.5% of range)
10 V	0.15 mV	± (0.6% of value + 0.5% of range)
30 V	0.45 mV	± (0.6% of value + 0.5% of range)
60 V	0.91 mV	± (0.6% of value + 0.5% of range)

Current source specifications

Range	Resolution	Accuracy
10 A	0.152 mA	± (0.6% of value + 0.5% of range)
100 A	1.52 mA	± (0.6% of value + 0.5% of range)
400 A	6.1 mA	± (0.6% of value + 0.5% of range)

Current measure specifications

Range	Resolution	Accuracy
10 A	0.152 mA	± (0.6% of value + 0.5% of range)
100 A	1.52 mA	± (0.6% of value + 0.5% of range)
400 A	6.1 mA	± (0.6% of value + 0.5% of range)

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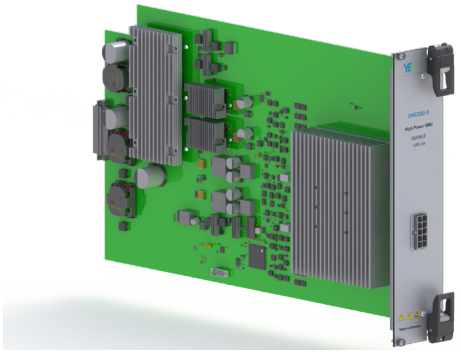
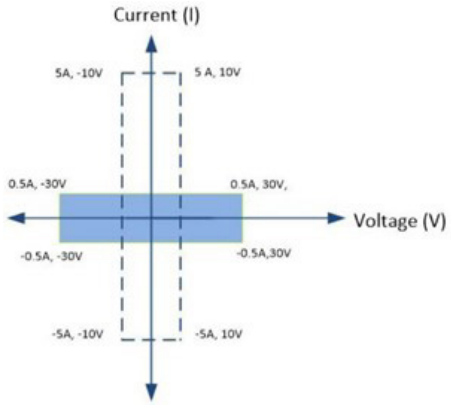
DVCS30-5 SMU

Features

- 2 independent channels
- High accuracy
- High resolution
- 4-quadrant operation:
- ±30 V, ±500 mA
- ±10 V, ±5 A
- High-speed sampling rate up to 1 MS / s
- Parallel voltage and current measurement
- Bandwidth selection (four positions)
- Compatible with LabVIEW 2020
- Operating system Windows 10
- Interface USB 2
- Power 48 V
- L x W x H : 410.6 mm x 37.5 mm x 233.5 mm





Electrical Performance Specifications

Force Voltage

- Ranges: ±3 V, ±5 V, ±10 V, ±30 V
- Resolution: 16 Bits
- Accuracy: ±0.05 % of range
- Max Current Pulsed: 5 A (10 mS 10 % duty cycle max)
- Max Current Continuous: 500 mA
- Max Current Clamp: 102 % I Range
- Current Clamp Resolution: 12 Bits
- Current Clamp Accuracy: ±3 % of range

Measure Voltage

- Ranges: ±3 V, ±5 V, ±10 V, ±30 V
- Resolution: 16 Bits
- Accuracy: ±0.05 % of range
- Sampling Rate: 1 MS/s

Force Current

- Resolution: 16 Bits
- Ranges: 5 uA, 50 uA, 500 uA, 5 mA, 50 mA, 500 mA 5 A (10 mS 10 % duty cycle max)
- Accuracy: ± (0.1 % of range + 0.002 % of range /V)
  ± (0.5 % of range + 0.002 % of range /V)
  500 uA, 5 mA, 50 mA, 500 mA, 5A 50 uA
  5 uA ± (0.6 % of range + 0.002 % of range /V)
- Max Voltage Clamp: 102 % V Range
- Voltage Clamp Resolution: 12 Bits
- Voltage Clamp Accuracy: ±3 % of range

Measure Current:

- Resolution: 16 Bits
- Ranges: 5 uA, 50 uA, 500 uA, 5 mA, 50 mA, 500 mA 5 A (10 mS 10 % duty cycle max)
- Accuracy: 500 uA, 5 mA, 50 mA, 500 mA, 5 A ± (0.1 % of range + 0.002 % of range /V)
- 50 uA ± (0.5 % of range +0.002 % of range /V) 5 uA ± (0.6 % of range +0.002 % of range /V)
- Sampling Rate: 1 MS/s

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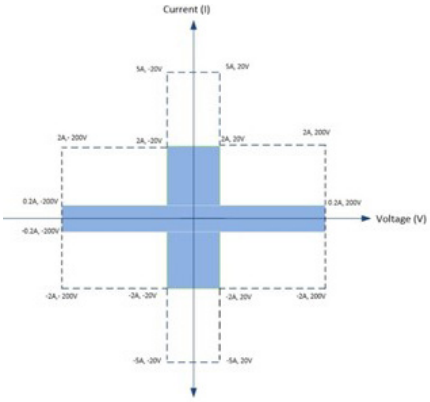
QVCS200-5 SMU

Features

- 4 independent channels
- High accuracy
- High resolution
- 4-quadrant operation
- Max current continuous
- 200 mA (max output voltage ±200 V)
- 2 A (max output voltage ±20 V)
- Max current pulsed
- 2 A (2 mS 5 % duty cycle max, max output voltage ±200 V)
- 5 A (2 mS 5 % duty cycle max, max output voltage ±20 V)
- High-speed sampling rate up to 1MS/s
- Parallel voltage and current measurement
- Bandwidth selection (four positions)
- Compatible with LabVIEW 2020
- Operating system Windows 10
- Interface USB 2
- Power 48 V



Electrical Performance Specifications

Force Voltage

- Ranges: ±1 V, ±5 V, ±10 V, ±20 V, ±100 V, ±200 V
- Resolution: 16 Bits
- Accuracy: ± (0.05 % of value + 0.05 % of range)
- Max Current Pulsed: 5A (2 mS 10 % duty cycle max)
- Max Current Continuous: 2 A
- Max Current Clamp: 102 % I Range
- Current Clamp Resolution: 12 Bits
- Current Clamp Accuracy: ±3 % of range

Measure Voltage

- Ranges: ±1 V, ±5 V, ±10 V, ±20 V, ±100 V, ±200 V
- Resolution: 16 Bits
- Accuracy: ± (0.05 % of value + 0.05 % of range)
- Sampling Rate: 1 MS/s

Force Current

- Resolution: 16 Bits
- Ranges: 5 uA, 50 uA, 500 uA, 5 mA, 50 mA, 200 mA 5 A (2 mS 10 % duty cycle max)
- Accuracy: 500 uA, 5m A, 50 mA, 500 mA, 5 A; ± (0.1 % of range + 0.002 % of range /V)
- 50 uA ± (1 % of range +0.002 % of range /V) 5 uA ± (1 % of range +0.002 % of range /V)
- Max Voltage Clamp: 102% V Range
- Voltage Clamp Resolution: 12 Bits
- Voltage Clamp Accuracy: ±3 % of range

Measure Current:

- Resolution: 16 Bits
- Ranges: 5 uA, 50 uA, 500 uA, 5 mA, 50 mA, 200 mA 5 A (2 mS 10 % duty cycle max)
- Accuracy: 500 uA, 5 mA, 50 mA, 500 mA, 5 A ± (0.1 % of range + 0.002 % of range /V)
- 50 uA ± (1 % of range +0.002 % of range /V) 5 uA ± (1 % of range +0.002 % of range /V)
- Sampling Rate 1 MS/

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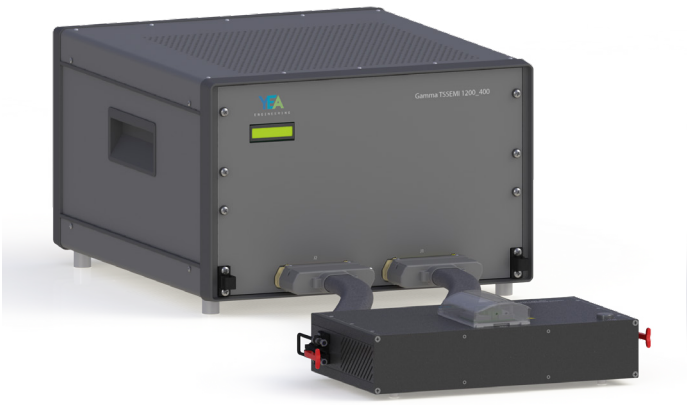
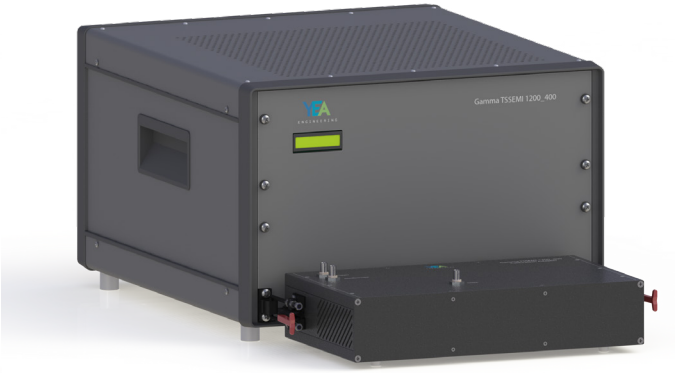
ADAPTER BOARDS

Dynamic Parameters Measurement Adapter

Calibration Adapter



Transistor Tester with
Dynamic Parameters Measurement Adapter



Transistor Tester with
Calibration Adapter

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