

# IWATSU

NEW

## WIDE-BANDWIDTH 30MHz Advanced AC B-H Analyzer

# B-H ANALYZER SY-8264

SY-8264 10Hz ~ 1MHz

- FREQUENCY OPTION SY-600 1MHz ~ 10MHz
- FREQUENCY OPTION SY-601 1MHz ~ 20MHz
- FREQUENCY OPTION SY-602 1MHz ~ 30MHz

- High-Accuracy Magnetic Characterization up to 30MHz
- Phase Measurement Accuracy of  $\pm 0.15^\circ$  at 10MHz
- Upgradeable Maximum Measurement Frequency (Optional)
- Acquires 26 Measurement Parameters in a Single Measurement



# A New Industry Standard

## Fully Automated AC Magnetic Property Measurement

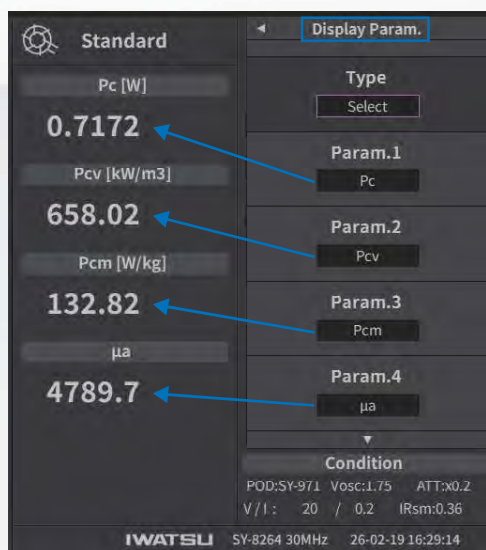


**NORMAL**  $\mu$  Instant switching of measurement result displays with one click.



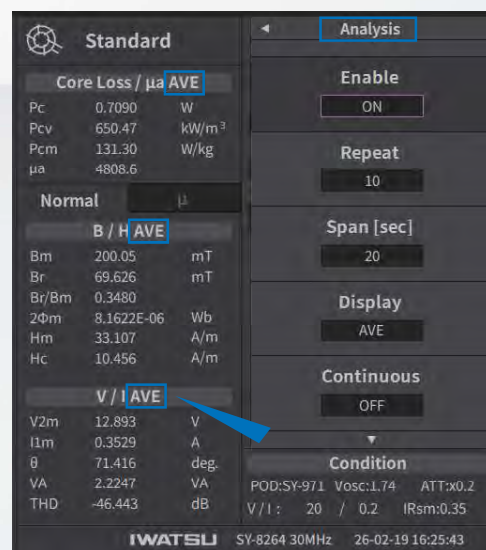
### Display Parameter

Large, easy-to-read display of up to five selected values from 26 measurement results.



### Analysis

Enabling this function allows configuration of the measurement repetition count, interval, and display mode (avg, max, min) per measurement continuous measurement function SY-821 enables measurement of time variation in multiple parameters during continuous operation.



### SY-5001



SY-5001 (PMK)

### High-Frequency, High-Power Bipolar Power Supply Dedicated to B-H Analyzers

#### Main Specification

Maximum Frequency : 5MHz Maximum Output Current :  $\pm 6$ Apeak Maximum Output Voltage :  $\pm 150$ Vpeak

|                          |                                                      |                            |
|--------------------------|------------------------------------------------------|----------------------------|
| Model                    | SY-5001                                              |                            |
| Frequency                | DC - 5MHz                                            |                            |
| Gain                     | 1、5、10、30、60 $\pm$ 2% ( $\pm 100$ ppm/ $^{\circ}$ C) |                            |
| Output Voltage           | Hi-Voltage                                           | $\pm 150$ Vpeak (f<800kHz) |
|                          | Lo-Voltage                                           | $\pm 64$ Vpeak (f<2MHz)    |
| Output Current           | Hi-Voltage                                           | $\pm 5$ Apeak (f>50Hz)     |
|                          | Lo-Voltage                                           | $\pm 6$ Apeak (f>50Hz)     |
| Output Impedance         | 30m $\Omega$ +0.33 $\mu$ H                           |                            |
| Dimensions (mm) / Weight | 約 449W $\times$ 178H $\times$ 435.5D / 約 19kg        |                            |

SY-5003 (Under development)  
30MHz Power Amplifier



# Compliant With CROSS-POWER(IEC62044-3)

## Accurate core loss measurement

- High-Accuracy Magnetic Characterization from Low Frequencies up to 30MHz
- Phase Measurement Accuracy of  $\pm 0.15^\circ$  at 10MHz
- $\pm 0.30^\circ$  Phase Accuracy at 30MHz (Single-Coil Method<sup>※1</sup>, Typical)
- Measurement up to 30MHz with the 2-Coil Method<sup>※2</sup> (Accuracy Guaranteed up to 10MHz<sup>※3</sup>)
- Optional frequency upgrade available at installation or anytime after deployment
- 26 measurement parameters can be acquired in a single measurement.
- A mouse and keyboard can also be used to operate the main unit.
- Flexible analysis settings allow you to define measurement count and interval in a single run.

※1 Method in which only the primary winding is wound around the measurement sample for measurement.

※2 Method in which both the primary and secondary windings are wound around the measurement sample for measurement.

※3 At high frequencies, measurement results can vary greatly depending on the winding configuration.

### BH ANALYZER (MAIN UNIT)

SY-8264 10Hz ~ 1MHz

- FREQUENCY OPTION SY-600 1MHz ~ 10MHz
- FREQUENCY OPTION SY-601 1MHz ~ 20MHz
- FREQUENCY OPTION SY-602 1MHz ~ 30MHz

### MEASUREMENT FREQUENCY

- 10Hz ~ 1MHz (SY-8264)
- 1MHz ~ 10MHz (SY-600)
- 1MHz ~ 20MHz (SY-601)
- 1MHz ~ 30MHz (SY-602)

### WAVE SHAPE

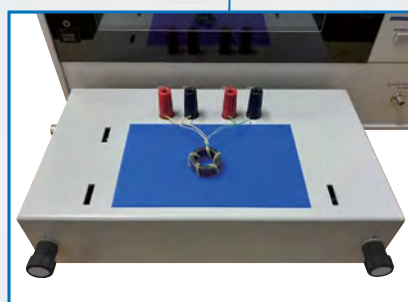
SIN(10Hz ~ 30MHz) / PULSE (10Hz ~ 1MHz)

- MAX CURRENT  $\pm 6A$
- MAX VOLTAGE  $\pm 200V$

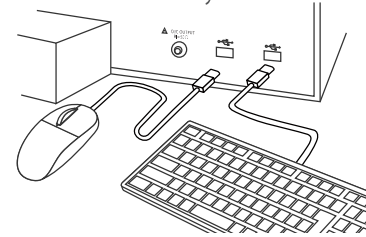
### EXCITATION METHOD

Automatic Excitation

(max magnetic field, max magnetic flux density, maximum excitation current, maximum induced voltage)



- Operation is possible using a mouse and keyboard.



※Residual magnetization is eliminated by applying a decaying alternating magnetic field

|                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Measurement Method     | CROSS-POWER Method (IEC62044-3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Measurement Parameters | Maximum Magnetic Flux Density (Bm), Residual Magnetic Flux Density (Br), Maximum Magnetic Field Strength (Hm), Coercive Force (Hc), Squareness Ratio (Br/Bm), Amplitude Permeability ( $\mu_a$ ), Core Loss (Pc, Pcv, Pcm), Maximum Excitation Current (Im), Maximum Induced Voltage (Vm), Phase Angle ( $\theta$ ), Total Magnetic Flux Change ( $2\phi_m$ ), Apparent Power (VA), Impedance Permeability ( $\mu_z$ ), Complex Permeability ( $\mu'$ , $\mu''$ ), Loss Factor ( $\tan \delta$ ), Inductance (L), Resistance (R), Impedance ( Z ), Quality Factor (Q), Total Harmonic Distortion (THD) |
| Measurement graph      | B-H, Excitation current, Induced voltage, Magnetic field, magnetic flux density.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Frequency              | SIN<br>10Hz ~ 1MHz(SY-8264) ※1MHz-30MHz(Optional)<br>PULSE<br>10Hz ~ 1MHz(Duty50%Fixed)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Magnetic Field         | Non-inductive resistor voltage drop method ( $\pm 6 A$ max.).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Magnetic Flux Density  | Induced-voltage detection coil terminal voltage method ( $\pm 200 V$ ).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Digitizer              | Resolution : 16bits (8192points/cycle)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| DUT conection          | 2-Coil or 1-Coil Method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Display                | 8.4 inch TFT-LCD SVGA 800×600                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Mechanical             | Weight 11.2kg、Dimensions 420W×266H×450D (mm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Interface              | USB (Storage)、LAN (for remotr control)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

### Optional maximum measurement frequency upgrade —available at installation or anytime afterward

Frequency Option After Installation of SY-8264

| MODEL                         | Frequency after upgraded |
|-------------------------------|--------------------------|
| SY-603 10MHz(from 1MHz unit)  | 1MHz ~ 10MHz             |
| SY-604 20MHz(from 1MHz unit)  | 1MHz ~ 20MHz             |
| SY-605 30MHz(from 1MHz unit)  | 1MHz ~ 30MHz             |
| SY-606 20MHz(from 10MHz unit) | 10MHz ~ 20MHz            |
| SY-607 30MHz(from 10MHz unit) | 10MHz ~ 30MHz            |
| SY-608 30MHz(from 20MHz unit) | 20MHz ~ 30MHz            |

# Remote Control Software SY-820 (Dedicated for SY-8264)

- By using the remote control software SY-820, the SY-8264 can be controlled from a PC via LAN, enabling automated measurements.
- Efficient measurements can be performed by setting multiple excitation conditions for a single DUT.
- Future hardware options to be released will also be controllable from SY-820.
- The SY-820 is included as a standard accessory with the SY-8264.

The screenshot displays the SY-820 software interface with a table of measurement results. A callout points to the '30000.0' value in the 'Freq. [kHz]' column, indicating the measurement results at 30 MHz. Another callout points to the 'Color selector' dialog, which allows users to choose a theme color (Normal or Dark) and a base color (Preset or Custom) from a list including Purple, LightGreen, Lime, Orange, Pink, Red, Teal, and Yellow.

| Position | Sample file name | Sample name | Sample param | target: aslan | target: unit | Function | Freq. [kHz] | Screen V <sub>dc</sub> [V] | Time stamp | Status | P <sub>dc</sub> [W] | P <sub>av</sub> [W/m <sup>2</sup> ] | P <sub>cr</sub> [W/m <sup>2</sup> ] | R <sub>m</sub> [mT] | B <sub>z</sub> [mT] | B <sub>z</sub> /B <sub>m</sub> | 2gm [Wb] | H <sub>ms</sub> [A/m] | H <sub>r</sub> [A/m] |       |
|----------|------------------|-------------|--------------|---------------|--------------|----------|-------------|----------------------------|------------|--------|---------------------|-------------------------------------|-------------------------------------|---------------------|---------------------|--------------------------------|----------|-----------------------|----------------------|-------|
| 1        | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 100.0       |                            | 11:31:33   | NONE   | 117.78E-9           | 432.71E-6                           | 33.476                              | 117.78E-6           | 0.1001              | 487.93E-6                      | 0.004476 | 2.5019E-6             | 2.378E-6             | 0.087 |
| 2        | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 200.0       |                            | 11:31:41   | NONE   | 174.77E-9           | 642.07E-6                           | 33.552                              | 174.77E-6           |                     |                                |          |                       |                      |       |
| 3        | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 300.0       |                            | 11:31:55   | NONE   | 245.68E-9           | 902.59E-6                           | 33.701                              | 245.68E-6           |                     |                                |          |                       |                      |       |
| 4        | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 500.0       |                            | 11:32:05   | NONE   | 374.24E-9           | 0.0013749                           | 33.674                              | 374.24E-6           | 0.0995              |                                |          |                       |                      |       |
| 5        | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 700.0       |                            | 11:32:17   | NONE   | 503.84E-9           | 0.001851                            | 33.443                              | 503.84E-6           | 0.1                 |                                |          |                       |                      |       |
| 6        | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 1000.0      |                            | 11:32:23   | NONE   | 701.47E-9           | 0.0025771                           | 33.449                              | 701.47E-6           | 0.0999              |                                |          |                       |                      |       |
| 7        | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 2000.0      |                            | 11:32:40   | NONE   | 1.2462E-6           | 0.0045561                           | 33.247                              | 0.0012402           | 0.0999              |                                |          |                       |                      |       |
| 8        | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 3000.0      |                            | 11:32:51   | NONE   | 1.728E-6            | 0.0063462                           | 33.315                              | 0.001728            | 0.0999              |                                |          |                       |                      |       |
| 9        | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 5000.0      |                            | 11:33:02   | NONE   | 2.5529E-6           | 0.0093789                           | 33.893                              | 0.0025529           | 0.0999              |                                |          |                       |                      |       |
| 10       | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 7000.0      |                            | 11:33:11   | NONE   | 3.9263E-6           | 0.014424                            | 34.387                              | 0.0039263           | 0.1                 |                                |          |                       |                      |       |
| 11       | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 10000.0     |                            | 11:33:25   | NONE   | 6.3823E-6           | 0.030795                            | 35.625                              | 0.0063823           | 0.0999              |                                |          |                       |                      |       |
| 12       | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 12000.0     |                            | 11:33:33   | NONE   | 9.4351E-6           | 0.034662                            | 36.675                              | 0.0094351           | 0.0999              |                                |          |                       |                      |       |
| 13       | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 15000.0     |                            | 11:33:50   | NONE   | 14.329E-6           | 0.052642                            | 39.049                              | 0.014329            | 0.1                 |                                |          |                       |                      |       |
| 14       | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 20000.0     |                            | 11:34:01   | NONE   | 29.727E-6           | 0.1092                              | 44.549                              | 0.029727            |                     |                                |          |                       |                      |       |
| 15       | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 22000.0     |                            | 11:34:15   | NONE   | 40.63E-6            | 0.1493                              | 47.847                              | 0.04063             | 0.0999              |                                |          |                       |                      |       |
| 16       | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 25000.0     |                            | 11:34:27   | NONE   | 60.575E-6           | 0.2225                              | 53.966                              | 0.060575            | 0.0999              | 0.01076                        | 0.010863 | 2.4763E-9             | 1.4806               | 0.044 |
| 17       | 1 test           | Sample      | Bm           | 0.1           | mT           | Sine     | 30000.0     |                            | 11:34:35   | NONE   | 72.518E-6           | 0.2664                              | 72.1                                | 0.072518            | 0.0999              | 0.018583                       | 0.018583 | 2.4978E-9             | 1.1927               | 0.043 |

## We will support a wide range of options.

### New Options

Compatibility with options for the SY-8218/8219 will be expanded progressively. Please consult the SY-8218/8219 catalog for specifications of each option.

### SOFTWARE OPTION

Continuous measurements function SY-821 make trend of measurement parameters

#### Wide-Range THURMAL CHAMBER SCANNER

Compliant with AEC-Q200 Grade 0



SY-330

#### TEMPERATURE CHAMBER SCANNER SYSTEM



SY-320A / SY-321A

#### DC BIAS TESTER



AC BLOCKER SY-962

DC BIAS SOURCE SY-961

DC BIAS TESTER SY-960

#### SHINGLE SHEET MEASUREMENT SYSTEM



SY-956

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**IWATSU**

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**IWATSU**



Semiconductor Curve Tracer  
**CS-8000 series**



## CS-8000 Series Technical datasheet

The CS-8000 series are equipped with a high voltage source of up to 5kV and a high current source of 2000A. With an optional SMU, the CS-8000 series can be used to measure the static characteristics of any power semiconductor. Equipped with pulse output, gate pattern, and very small current measurement functions, the CS-8000 series strongly supports design evaluation of wide bandgap semiconductors such as SiC and GaN.



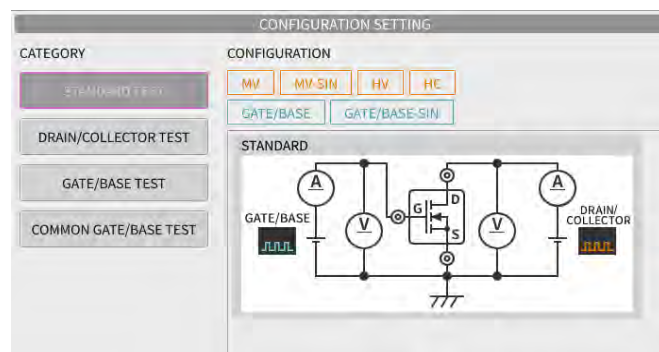
- Up to 5kV, 2kA High-Power Test
- Easy-to-operate graphical user interface
- Accurate very small current measurement (Resolution 250fA)
- Large 12.1-inch Touch Screen
- Variety of GATE Signal Output
- Enhanced Temperature Characteristic Measurement Option
- On-Wafer High-Power Testing with Wafer-Prober

- UI designed for ease of use



The 12.1 inch Touch Screen, front panel buttons and rotary knob provide intuitive operation. The on-screen keyboard on the screen and the numeric keypad on the front panel allow you to enter settings, limit values, and so on. To enable operation by USB mouse/keyboard.

- Configuration for various experiment



The graphical display of the measurement configuration makes easy to set various settings. The test fixture CS-322 HV/HC automatically switches the internal matrix switch to match the configuration settings, eliminating the need for a wiring swap. It is also not necessary to switch the connection between HV and HC units manually. Because the internal relay automatically switches through the configuration settings. These functions prevent incorrect wiring during measurement.

- Improved on-wafer testing affinity

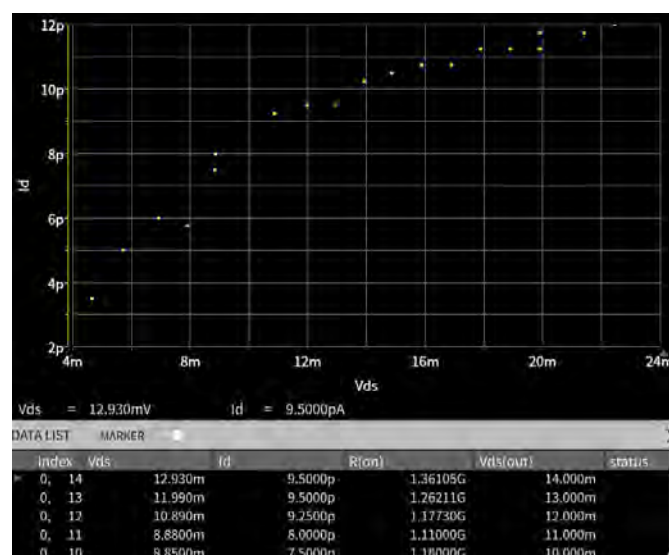
The output terminals are fitted with noise resistant triaxial for easy connection to wafer-prober.



- Output sources for your application

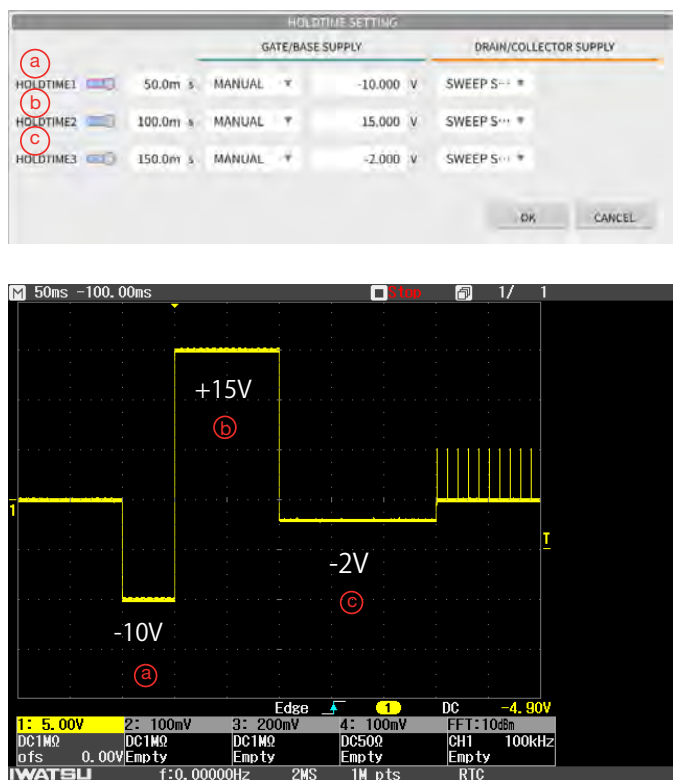
High-current SMU up to 2000 A. Because of the HC unit with the high current mode, high current measurements up to 2kA can be performed. The pulse width, measuring period and measuring range can be varied. Pulse width, measurement cycle, and measurement range can be varied. SMU can be selected as desired for measurements of Ultra-high voltage SMU up to 15 kV, temperature sensors, backgates, etc.

- Minimum current resolution 250fA



The use of triaxial and the optimization of the measurement system has reduced leakage and noise in the equipment, so the stable measurement of very small currents can be performed.

## Flexible GATE signal output

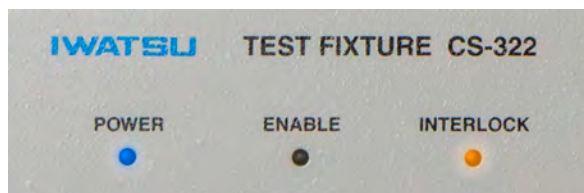


The gate signal can be sequenced and applied.

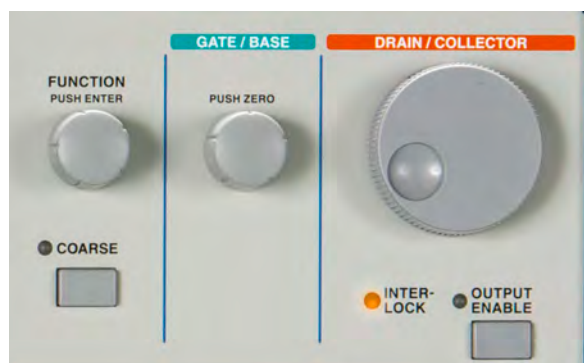
Hold-time variable range 0.000[s] ~ 5.000[s]

Pre-signal GATE voltage -40[V] ~ +40[V]

## Interlock Function



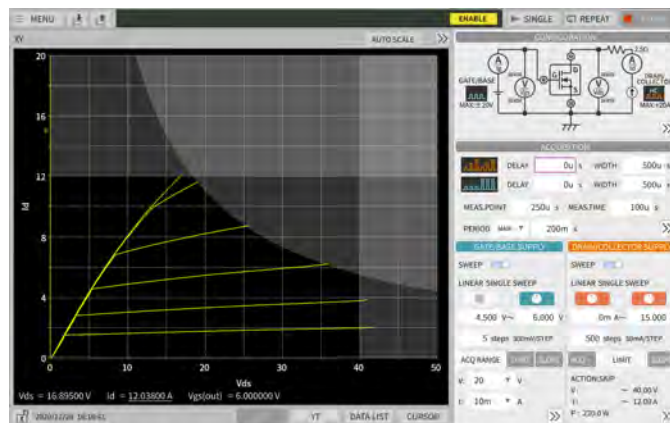
TEST FIXTURE



MAIN UNIT

An interlock function is linked to the cover of the fixture. During interlock operation, the output is turned off to avoid the electric shock, and the curve tracer keeps safe measurements. Even when you use the probe or temperature chambers, the curve tracer keeps safe measurement in conjunction with external interlock terminal. The LEDs in main unit and test fixture indicate the state of the interlock.

## Output Limit Function



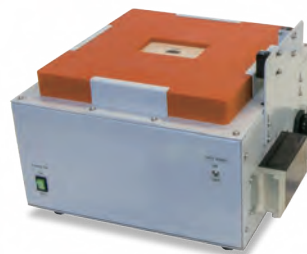
Voltage, current, and power limits can be set to prevent damage to the target. In addition, the hardware overcurrent protection function shuts off current when 1.4 times the current flow of the measuring range.

## Automatic measurement for the multiple devices



The optional scanner system CS-700 series enables measurement of multiple devices. Automatic measurement is possible by controlling the curve tracer and scanner system with the automatic measurement software CS-830.

## Temperature characteristic measurement



Evaluation of temperature characteristics is required for targets used in high and low temperature environments during actual operation. CS-8000 can be used in combination with hotplate and Thermo Stream to measure temperature characteristics. The use of Thermo Stream requires test fixture and adapters. Automatic measurement is also possible with software CS-830.

## ■ Main Unit



Three types of main units can be selected depending on the required measurement voltage. The main unit includes the HV unit (not included in the CS-8020), MV unit, and gate unit. The high current unit, fixture, and optional SMU are operated from the main unit.

| Model     | CS-8500  | CS-8200   | CS-8020 |
|-----------|----------|-----------|---------|
| HV UNIT   | 5kV(8mA) | 2kV(20mA) | -       |
| MV UNIT   | 200V(2A) |           |         |
| GATE UNIT | 40V(1A)  |           |         |

## ■ HV UNIT(5kV)

### OUTPUT PART

#### OUTPUT VOLTAGE

| Voltage Range | Setting Resolution | Mode     | Polarity | Max. Peak Current |
|---------------|--------------------|----------|----------|-------------------|
| • 5kV         | 250mV              | DC/PULSE | + / -    | 8mA               |
| • 2kV         | 100mV              | DC/PULSE | + / -    | 8mA               |
| • 1kV         | 50mV               | DC/PULSE | + / -    | 8mA               |
| • 500V        | 25mV               | DC/PULSE | + / -    | 8mA               |
| • 200V        | 10mV               | DC/PULSE | + / -    | 8mA               |

#### OUTPUT CURRENT

| Current Range | Setting Resolution | Mode      | Polarity | Max. Peak Voltage |
|---------------|--------------------|-----------|----------|-------------------|
| • 10mA        | 500nA              | DC/ PULSE | + / -    | 5kV               |
| • 5mA         | 250nA              | DC/ PULSE | + / -    | 5kV               |
| • 2mA         | 100nA              | DC/ PULSE | + / -    | 5kV               |
| • 1mA         | 50nA               | DC/ PULSE | + / -    | 5kV               |
| • 500μA       | 25nA               | DC/ PULSE | + / -    | 5kV               |
| • 200μA       | 10nA               | DC/ PULSE | + / -    | 5kV               |
| • 100μA       | 5nA                | DC/ PULSE | + / -    | 5kV               |
| • 50μA        | 2.5nA              | DC/ PULSE | + / -    | 5kV               |
| • 2mA         | 100nA              | DC/ PULSE | + / -    | 5kV               |
| • 1mA         | 50nA               | DC/ PULSE | + / -    | 5kV               |
| • 500μA       | 25nA               | DC/ PULSE | + / -    | 5kV               |
| • 200μA       | 10nA               | DC/ PULSE | + / -    | 5kV               |
| • 100μA       | 5nA                | DC/ PULSE | + / -    | 5kV               |
| • 50μA        | 2.5nA              | DC/ PULSE | + / -    | 5kV               |

#### PULSE

| Pulse Mode | Pulse Width | Duty Cycle  |
|------------|-------------|-------------|
| PULSE      | 20mS ~ 1.6S | ≤ 50% ~ 80% |

※ It may not be possible to output up to the Max. voltage/current if the pulse width is narrow.

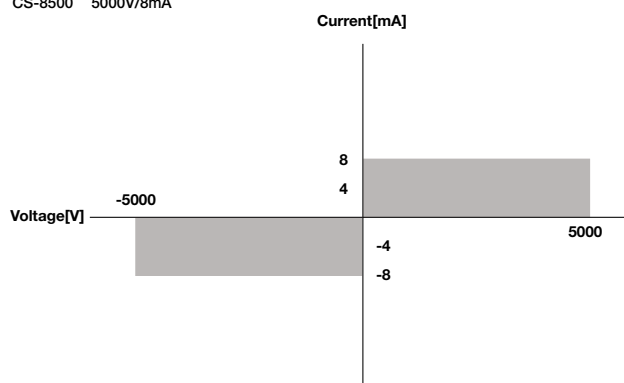
### Setting Accuracy

DC/PULSE :  $\pm$  (Set Value x 1.5% + Set Range x 0.5%)

### OUTPUT RANGE

#### ■HV UNIT

CS-8500 5000V/8mA



### MEASUREMENT PART

#### MEASUREMENT VOLTAGE

| Voltage Range | Setting Resolution | Voltage Range | Setting Resolution |
|---------------|--------------------|---------------|--------------------|
| • 5kV         | 250mV              | 200V          | 10mV               |
| • 2kV         | 100mV              | 100V          | 5mV                |
| • 1kV         | 50mV               | 50V           | 2.5mV              |
| • 500V        | 25mV               | -             | -                  |

### Voltage Measurement Accuracy

DC/PULSE :  $\pm$  (Set Value x 1.5% + Set Range x 0.5%)

#### MEASUREMENT CURRENT

| Current Range | Setting Resolution | Current Range | Setting Resolution |
|---------------|--------------------|---------------|--------------------|
| • 10mA        | 500nA              | 500μA         | 25nA               |
| • 5mA         | 250nA              | 200μA         | 10nA               |
| • 2mA         | 100nA              | 100μA         | 5nA                |
| • 1mA         | 50nA               | 50μA          | 2.5nA              |



| MEASUREMENT CURRENT (LEAKAGE MODE) |                    |               |                    |
|------------------------------------|--------------------|---------------|--------------------|
| Current Range                      | Setting Resolution | Current Range | Setting Resolution |
| • 2mA                              | 100nA              | 1μA           | 50pA               |
| • 1mA                              | 50nA               | 500nA         | 25pA               |
| • 500μA                            | 25nA               | 200nA         | 10pA               |
| • 200μA                            | 10nA               | 100nA         | 5pA                |
| • 100μA                            | 5nA                | 50nA          | 2.5pA              |
| • 50μA                             | 2.5nA              | 20nA          | 1pA                |
| • 5μA                              | 250pA              | 10nA          | 500fA              |
| • 2μA                              | 100pA              | 5nA           | 250fA              |

## MEASUREMENT CURRENT ACCURACY

2A ~ 10μA range :

$\pm (\text{Measured value} \times 1.5\% + \text{Measurement range} \times 0.5\%) \pm (\text{Measurement range} \times 0.002\% \times \text{Output voltage})$

20nA ~ 5nA range :

$\pm (\text{Measured value} \times 1.5\% + \text{Measurement range} \times 0.5\%) \pm (\text{Measurement range} \times 0.002\% \times \text{Output voltage}) \pm 200\text{pA}$

## DYNAMIC RANGE (MEASUREMENT CURRENT)

It is possible to measure within measurement current range.

## ■ HV UNIT(2kV)

### OUTPUT PART

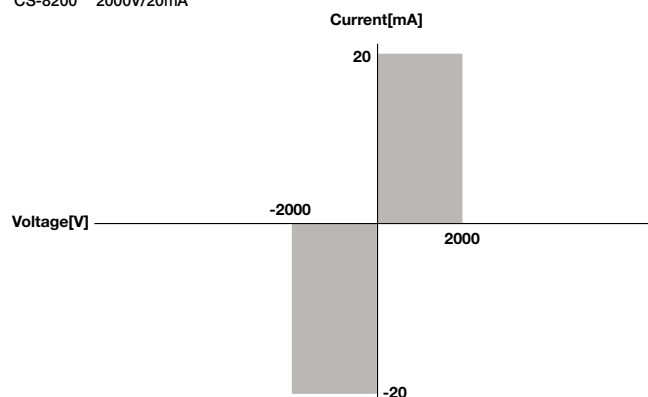
| OUTPUT VOLTAGE |                    |          |          |                   |
|----------------|--------------------|----------|----------|-------------------|
| Voltage Range  | Setting Resolution | Mode     | Polarity | Max. Peak Current |
| • 2kV          | 100mV              | DC/PULSE | + / -    | 8mA               |
| • 1kV          | 50mV               | DC/PULSE | + / -    | 8mA               |
| • 500V         | 25mV               | DC/PULSE | + / -    | 8mA               |
| • 200V         | 10mV               | DC/PULSE | + / -    | 8mA               |

| OUTPUT CURRENT |                    |           |          |                   |
|----------------|--------------------|-----------|----------|-------------------|
| Current Range  | Setting Resolution | Mode      | Polarity | Max. Peak Current |
| • 20mA         | 1μA                | DC/ PULSE | + / -    |                   |
| • 10mA         | 500nA              | DC/ PULSE | + / -    |                   |
| • 5mA          | 250nA              | DC/ PULSE | + / -    |                   |
| • 2mA          | 100nA              | DC/ PULSE | + / -    |                   |
| • 1mA          | 50nA               | DC/ PULSE | + / -    |                   |
| • 500μA        | 25nA               | DC/ PULSE | + / -    |                   |
| • 200μA        | 10nA               | DC/ PULSE | + / -    |                   |
| • 100μA        | 5nA                | DC/ PULSE | + / -    |                   |
| • 50μA         | 2.5nA              | DC/ PULSE | + / -    |                   |
| • 2mA          | 100nA              | DC/ PULSE | + / -    |                   |
| • 1mA          | 50nA               | DC/ PULSE | + / -    |                   |
| • 500μA        | 25nA               | DC/ PULSE | + / -    |                   |
| • 200μA        | 10nA               | DC/ PULSE | + / -    |                   |
| • 100μA        | 5nA                | DC/ PULSE | + / -    |                   |
| • 50μA         | 2.5nA              | DC/ PULSE | + / -    |                   |

### OUTPUT RANGE

#### ■ HV UNIT

CS-8200 2000V/20mA



### MEASUREMENT PART

| MEASUREMENT VOLTAGE |                    |               |                    |
|---------------------|--------------------|---------------|--------------------|
| Voltage Range       | Setting Resolution | Voltage Range | Setting Resolution |
| • 2kV               | 100mV              | 200V          | 10mV               |
| • 1kV               | 50mV               | 100V          | 5mV                |
| • 500V              | 25mV               | 50V           | 2.5mV              |

### Voltage Measurement Accuracy

DC/PULSE :  $\pm (\text{Set Value} \times 1.5\% + \text{Set Range} \times 0.5\%)$

### Dynamic Range (Measurement Voltage)

It is possible to measure up to 125% of the measurement voltage range.

| PULSE      |             |                       |
|------------|-------------|-----------------------|
| Pulse Mode | Pulse Width | Duty Cycle            |
| PULSE      | 20mS ~ 1.6S | $\leq 50\% \sim 80\%$ |

\*It may not be possible to output up to the Max. voltage/current if the pulse width is narrow.

### Setting Accuracy

DC/PULSE :  $\pm (\text{Set Value} \times 1.5\% + \text{Set Range} \times 0.5\%)$

| MEASUREMENT CURRENT |                    |               |                    |
|---------------------|--------------------|---------------|--------------------|
| Current Range       | Setting Resolution | Current Range | Setting Resolution |
| • 20mA              | 1μA                | 500μA         | 25nA               |
| • 10mA              | 500nA              | 200μA         | 10nA               |
| • 5mA               | 250nA              | 100μA         | 5nA                |
| • 2mA               | 100nA              | 50μA          | 2.5nA              |
| • 1mA               | 50nA               | -             | -                  |

| MEASUREMENT CURRENT (LEAKAGE MODE) |                    |               |                    |
|------------------------------------|--------------------|---------------|--------------------|
| Current Range                      | Setting Resolution | Current Range | Setting Resolution |
| • 2mA                              | 100nA              | 1μA           | 50pA               |
| • 1mA                              | 50nA               | 500nA         | 25pA               |
| • 500μA                            | 25nA               | 200nA         | 10pA               |
| • 200μA                            | 10nA               | 100nA         | 5pA                |
| • 100μA                            | 5nA                | 50nA          | 2.5pA              |
| • 50μA                             | 2.5nA              | 20nA          | 1pA                |
| • 5μA                              | 250pA              | 10nA          | 500fA              |
| • 2μA                              | 100pA              | 5nA           | 250fA              |

## Current Measurement Accuracy

2mA ~ 50nA Range :

$\pm (\text{Set Value} \times 1.5\% + \text{Set Range} \times 0.5\%) \pm (\text{Measurement range} \times 0.002\% \times V_o)$  ( $V_o$  is the output voltage [V])

20nA ~ 5nA Range :

$\pm (\text{Set Value} \times 1.5\% + \text{Set Range} \times 0.5\%) \pm (\text{Measurement Range} \times 5.0\% + 200\text{pA})$

## Dynamic Range (Measurement Current)

It is possible to measure within measurement current range.

## ■ MV UNIT(200W)

### OUTPUT PART

| OUTPUT VOLTAGE |                    |             |           |                   |
|----------------|--------------------|-------------|-----------|-------------------|
| Voltage Range  | Setting Resolution | Mode        | Polarity  | Max. Peak Current |
| • 200V         | 10mV               | DC/AC/PULSE | + / -     | 1A                |
| • 100V         | 5mV                | DC/AC/PULSE | + / - / ± | 2A                |
| • 50V          | 2.5mV              | DC/AC/PULSE | + / - / ± | 2A                |
| • 20V          | 1mV                | DC/AC/PULSE | + / - / ± | 2A                |

| OUTPUT CURRENT |                    |             |           |                   |
|----------------|--------------------|-------------|-----------|-------------------|
| Current Range  | Setting Resolution | Mode        | Polarity  | Max. Peak Voltage |
| • 2A           | 100μA              | PULSE       | + / -     | 100V              |
| • 1A           | 50μA               | PULSE       | + / - / ± | 100V              |
| • 500mA        | 25μA               | PULSE       | + / - / ± | 100V              |
| • 200mA        | 10μA               | DC/AC/PULSE | + / - / ± | 100V              |
| • 100mA        | 5μA                | DC/AC/PULSE | + / - / ± | 100V              |
| • 50mA         | 2.5μA              | DC/AC/PULSE | + / - / ± | 100V              |
| • 20mA         | 1μA                | DC/AC/PULSE | + / - / ± | 100V              |
| • 10mA         | 500nA              | DC/AC/PULSE | + / - / ± | 100V              |
| • 5mA          | 250nA              | DC/AC/PULSE | + / - / ± | 100V              |
| • 2mA          | 100nA              | DC/AC/PULSE | + / - / ± | 100V              |
| • 1mA          | 50nA               | DC/AC/PULSE | + / - / ± | 100V              |
| • 500μA        | 25nA               | DC/AC/PULSE | + / - / ± | 100V              |
| • 200μA        | 10nA               | DC/AC/PULSE | + / - / ± | 100V              |
| • 100μA        | 5nA                | DC/AC/PULSE | + / - / ± | 100V              |
| • 50μA         | 2.5nA              | DC/AC/PULSE | + / - / ± | 100V              |
| • 20μA         | 1nA                | DC/AC/PULSE | + / - / ± | 100V              |
| • 10μA         | 500pA              | DC/AC/PULSE | + / - / ± | 100V              |
| • 5μA          | 250pA              | DC/AC/PULSE | + / - / ± | 100V              |
| • 2μA          | 100pA              | DC/AC/PULSE | + / - / ± | 100V              |
| • 1μA          | 50pA               | DC/AC/PULSE | + / - / ± | 100V              |
| • 500nA        | 25pA               | DC/AC/PULSE | + / - / ± | 100V              |
| • 200nA        | 10pA               | DC/AC/PULSE | + / - / ± | 100V              |
| • 100nA        | 5pA                | DC/AC/PULSE | + / - / ± | 100V              |
| • 50nA         | 2.5pA              | DC/AC/PULSE | + / - / ± | 100V              |
| • 20nA         | 1pA                | DC/AC/PULSE | + / - / ± | 100V              |
| • 10nA         | 500fA              | DC/AC/PULSE | + / - / ± | 100V              |
| • 5nA          | 250fA              | DC/AC/PULSE | + / - / ± | 100V              |

| PULSE OUTPUT |             |             |
|--------------|-------------|-------------|
| Pulse Mode   | Pulse Width | Duty Cycle  |
| PULSE        | 20mS ~ 1.6S | ≤ 50% ~ 80% |

\*When the pulse width is narrow, it may not be possible to output up to the maximum voltage / current.

### SINE OUTPUT

MODE: AC, Rectified

(Full wave (1/1), Half wave (1/2), 1/3 ~ 1/50)

### SETTING RESOLUTION

DC / PULSE: 1/ ± 20000 of Set range

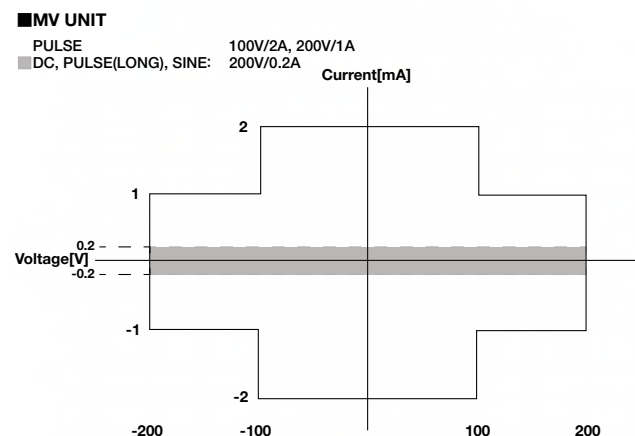
AC: 1/ ± 1000 of Set range

### MEASUREMENT PART

| MEASUREMENT CURRENT |                    |               |                    |                   |
|---------------------|--------------------|---------------|--------------------|-------------------|
| Current Range       | Setting Resolution | Current Range | Setting Resolution | Max. Peak Voltage |
| • 2A                | 100μA              | PULSE         | + / -              | 100V              |
| • 1A                | 50μA               | PULSE         | + / - / ±          | 200V              |
| • 500mA             | 25μA               | PULSE         | + / - / ±          | -                 |
| • 200mA             | 10μA               | DC/AC/PULSE   | + / - / ±          | -                 |
| • 100mA             | 5μA                | DC/AC/PULSE   | + / - / ±          | -                 |
| • 50mA              | 2.5μA              | DC/AC/PULSE   | + / - / ±          | -                 |
| • 20mA              | 1μA                | DC/AC/PULSE   | + / - / ±          | -                 |
| • 10mA              | 500nA              | DC/AC/PULSE   | + / - / ±          | -                 |
| • 5mA               | 250nA              | DC/AC/PULSE   | + / - / ±          | -                 |
| • 2mA               | 100nA              | DC/AC/PULSE   | + / - / ±          | -                 |
| • 1mA               | 50nA               | DC/AC/PULSE   | + / - / ±          | -                 |
| • 500μA             | 25nA               | DC/AC/PULSE   | + / - / ±          | -                 |
| • 200μA             | 10nA               | DC/AC/PULSE   | + / - / ±          | -                 |
| • 100μA             | 5nA                | DC/AC/PULSE   | + / - / ±          | -                 |
| • 50μA              | 2.5nA              | DC/AC/PULSE   | + / - / ±          | -                 |
| • 20μA              | 1nA                | DC/AC/PULSE   | + / - / ±          | -                 |
| • 10μA              | 500pA              | DC/AC/PULSE   | + / - / ±          | -                 |
| • 5μA               | 250pA              | DC/AC/PULSE   | + / - / ±          | -                 |
| • 2μA               | 100pA              | DC/AC/PULSE   | + / - / ±          | -                 |
| • 1μA               | 50pA               | DC/AC/PULSE   | + / - / ±          | -                 |
| • 500nA             | 25pA               | DC/AC/PULSE   | + / - / ±          | -                 |
| • 200nA             | 10pA               | DC/AC/PULSE   | + / - / ±          | -                 |
| • 100nA             | 5pA                | DC/AC/PULSE   | + / - / ±          | -                 |
| • 50nA              | 2.5pA              | DC/AC/PULSE   | + / - / ±          | -                 |
| • 20nA              | 1pA                | DC/AC/PULSE   | + / - / ±          | -                 |
| • 10nA              | 500fA              | DC/AC/PULSE   | + / - / ±          | -                 |
| • 5nA               | 250fA              | DC/AC/PULSE   | + / - / ±          | -                 |

## ■ MV UNIT(200W)

### OUTPUT RANGE



### MEASUREMENT PART

| MEASUREMENT VOLTAGE |                    |               |                    |
|---------------------|--------------------|---------------|--------------------|
| Voltage Range       | Setting Resolution | Voltage Range | Setting Resolution |
| • 200V              | 10mV               | 5V            | 250μV              |
| • 100V              | 5mV                | 2V            | 100μV              |
| • 50V               | 2.5mV              | 1V            | 50μV               |
| • 20V               | 1mV                | 500mV         | 25μV               |
| • 10V               | 500μV              | 200mV         | 10μV               |

### MEASUREMENT VOLTAGE ACCURACY

DC/Pulse (200 m V range except) :

$\pm (\text{Measured value} \times 1.2\% + \text{Measurement range} \times 0.4\%)$

DC/Pulse (200 m V range) :

$\pm (\text{Measured value} \times 1.2\% + \text{Measurement range} \times 0.4 \pm 10\text{mV})$

AC :  $\pm (\text{Measured value} \times 2\% + \text{Measurement range} \times 0.5\%)$

### DYNAMIC RANGE (MEASUREMENT CURRENT)

Up to 125% of the measurement range can be measured.

\*Accuracy is specified only in the measurement range.

### MEASUREMENT CURRENT

DC/Pulse (2A ~ 10μA range)

$\pm (\text{Measured value} \times 1.2\% + \text{Measurement range} \times 0.4\%)$

$\pm (\text{Measurement range} \times 0.002\% \times \text{Output voltage})$

DC/Pulse (200mV range)

$\pm (\text{Measured value} \times 1.2\% + \text{Measurement range} \times 0.4\%)$

$\pm (\text{Measurement range} \times 0.002\% \times \text{Output voltage}) \pm 50\text{pA}$

AC :  $\pm (\text{Measured value} \times 2\% + \text{Measurement range} \times 0.5\%)$

### DYNAMIC RANGE (MEASUREMENT CURRENT)

Up to 125% of the measurement range can be measured.

\*Accuracy is specified only in the measurement range.

## ■ GATE UNIT(40W)

### OUTPUT PART

| OUTPUT VOLTAGE |                    |             |           |                   |
|----------------|--------------------|-------------|-----------|-------------------|
| Voltage Range  | Setting Resolution | Mode        | Polarity  | Max. Peak Current |
| • 40V          | 2mV                | DC/AC/PULSE | + / - / ± | 1A                |
| • 20V          | 1mV                | DC/AC/PULSE | + / - / ± | 1A                |
| • 10V          | 500μV              | DC/AC/PULSE | + / - / ± | 1A                |
| • 5V           | 200μV              | DC/AC/PULSE | + / - / ± | 1A                |
| • 2V           | 100μV              | DC/AC/PULSE | + / - / ± | 1A                |
| • 1V           | 50μV               | DC/AC/PULSE | + / - / ± | 1A                |

| PULSE OUTPUT |             |             |
|--------------|-------------|-------------|
| Pulse Mode   | Pulse Width | Duty Cycle  |
| PULSE        | 50μS ~ 10mS | ≤ 10%       |
| PULSE(LONG)  | 50μS ~ 1.6S | ≤ 50% ~ 80% |

\*When the pulse width is narrow, it may not be possible to output up to the maximum voltage / current.

| OUTPUT CURRENT |                    |             |           |                   |
|----------------|--------------------|-------------|-----------|-------------------|
| Current Range  | Setting Resolution | Mode        | Polarity  | Max. Peak Voltage |
| • 1A           | 50μA               | PULSE       | + / - / ± | -                 |
| • 500mA        | 25μA               | PULSE       | + / - / ± | -                 |
| • 200mA        | 10μA               | PULSE       | + / - / ± | -                 |
| • 100mA        | 5μA                | DC/AC/PULSE | + / - / ± | -                 |
| • 50mA         | 2.5μA              | DC/AC/PULSE | + / - / ± | -                 |
| • 20mA         | 1μA                | DC/AC/PULSE | + / - / ± | -                 |
| • 10mA         | 500nA              | DC/AC/PULSE | + / - / ± | -                 |
| • 5mA          | 250nA              | DC/AC/PULSE | + / - / ± | -                 |
| • 2mA          | 100nA              | DC/AC/PULSE | + / - / ± | -                 |
| • 1mA          | 50nA               | DC/AC/PULSE | + / - / ± | -                 |
| • 500μA        | 25nA               | DC/AC/PULSE | + / - / ± | -                 |
| • 200μA        | 10nA               | DC/AC/PULSE | + / - / ± | -                 |
| • 100μA        | 5nA                | DC/AC/PULSE | + / - / ± | -                 |
| • 50μA         | 2.5nA              | DC/AC/PULSE | + / - / ± | -                 |
| • 20μA         | 1nA                | DC/AC/PULSE | + / - / ± | -                 |
| • 10μA         | 500pA              | DC/AC/PULSE | + / - / ± | -                 |
| • 5μA          | 250pA              | DC/AC/PULSE | + / - / ± | -                 |
| • 2μA          | 100pA              | DC/AC/PULSE | + / - / ± | -                 |
| • 1μA          | 50pA               | DC/AC/PULSE | + / - / ± | -                 |
| • 500nA        | 25pA               | DC/AC/PULSE | + / - / ± | -                 |
| • 200nA        | 10pA               | DC/AC/PULSE | + / - / ± | -                 |
| • 100nA        | 5pA                | DC/AC/PULSE | + / - / ± | -                 |
| • 50nA         | 2.5pA              | DC/AC/PULSE | + / - / ± | -                 |
| • 20nA         | 1pA                | DC/AC/PULSE | + / - / ± | -                 |
| • 10nA         | 500fA              | DC/AC/PULSE | + / - / ± | -                 |
| • 5nA          | 250fA              | DC/AC/PULSE | + / - / ± | -                 |



## ■ GATE UNIT(40W)

### SINE OUTPUT

MODE: AC

FREQUENCY: 50Hz (AC)

### SETTING ACCURACY

DC / PULSE:  $\pm (\text{Set value} \times 1.2\% + \text{Set range} \times 0.4\%)$

AC :  $\pm (\text{Set value} \times 2\% + \text{Set range} \times 0.5\%)$

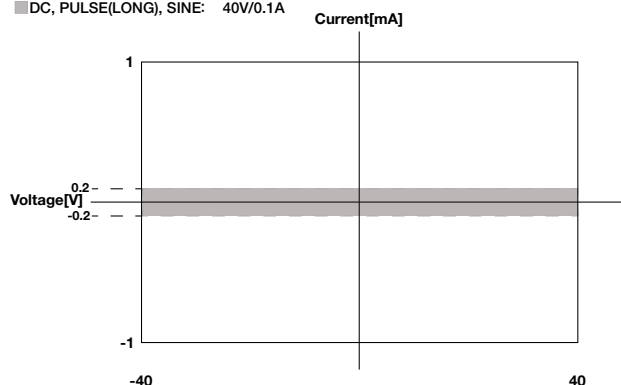
### OUTPUT RANGE

#### ■ GATE UNIT

PULSE

DC, PULSE(LONG), SINE: 40V/1A

40V/0.1A



### OUTPUT PART

#### OUTPUT VOLTAGE

| Voltage Range | Setting Resolution | Voltage Range | Setting Resolution |
|---------------|--------------------|---------------|--------------------|
| • 50V         | 2.5mV              | 5V            | 250μV              |
| • 20V         | 1mV                | 2V            | 100μV              |
| • 10V         | 500μV              | 1V            | 50μV               |

### SETTING ACCURACY

DC / PULSE:  $\pm (\text{Set value} \times 1.2\% + \text{Set range} \times 0.4\%)$

AC :  $\pm (\text{Set value} \times 2\% + \text{Set range} \times 0.5\%)$

## ■ OTHER SPECIFICATION

### GND UNIT

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

Maximum sink current  $\pm 2.5\text{ A}$

Connecting terminal FORCE、SENSE (Triaxial)

### AUX

Output voltage(※ 1)  $\pm 40\text{ V}$

Output current  $\pm 50\text{ mA}$  (TYP)

※ 1: Output only during measurement

### TRIG OUT

Output voltage 3.3 V CMOS output

Output at the start of the measurement cycle

### DISPLAY

Display 12.1 inch TFT-LCD with touch panel

Dimensions (H × V) 261.12 mm × 163.2 mm

Number of pixels 1280 × 800 (WXGA)

Screen display XY, YT, DATA LIST, CURSOR

### Power Source

Power Voltage Range AC100V ~ 240 V  $\pm 10\%$

Frequency 50/60Hz

Power line consumption 220 VA max (CS-8200/8500)

200 VA max (CS-8020)

### DYNAMIC RANGE (MEASUREMENT CURRENT)

Up to 125% of the measurement range can be measured.

\*Accuracy is specified only in the measurement range.

### MEASUREMENT PART

#### MEASUREMENT CURRENT

| Current Range | Setting Resolution | Current Range | Setting Resolution |
|---------------|--------------------|---------------|--------------------|
| • 1A          | 50μA               | 50μA          | 2.5nA              |
| • 500mA       | 25μA               | 20μA          | 1nA                |
| • 200mA       | 10μA               | 10μA          | 500pA              |
| • 100mA       | 5μA                | 5μA           | 250pA              |
| • 50mA        | 2.5μA              | 2μA           | 100pA              |
| • 20mA        | 1μA                | 1μA           | 50pA               |
| • 10mA        | 500nA              | 500nA         | 25pA               |
| • 5mA         | 250nA              | 200nA         | 10pA               |
| • 2mA         | 100nA              | 100nA         | 5pA                |
| • 1mA         | 50nA               | 50nA          | 2.5pA              |
| • 500μA       | 25nA               | 20nA          | 1pA                |
| • 200μA       | 10nA               | 10nA          | 500fA              |
| • 100μA       | 5nA                | 5nA           | 250fA              |

### MEASUREMENT CURRENT ACCURACY

2A ~ 50μA range:

$\pm (\text{Measured value} \times 1.2\% + \text{Measurement range} \times 0.4\%)$

$\pm (\text{Measurement range} \times 0.002\% \times \text{Output voltage})$

20μA ~ 5nA range:

$(\text{Measured value} \times 1.2\% + \text{Measurement range} \times 0.4\%)$

$\pm (\text{Measurement range} \times 0.002\% \times \text{Output voltage})$

$\pm 50\text{ pA}$

### DYNAMIC RANGE (MEASUREMENT CURRENT)

Up to 125% of the measurement range can be measured.

※ Accuracy is specified only in the measurement range.

### Physical characteristics

Dimensions W424 mm × H221 mm × D556 mm

Weight About 21 kg (CS-8200/8500)

About 19 kg (CS-8020)

### Accessory

Control interface terminator

Protective cover right

Protective cover left

Fixed belt

Instruction manual (this manual)

CD (Instruction Manual / Remote Control Manual)

Power Cord

Cord Strap

### Compliance Information Low Voltage Directive (Safety)

EN61010-1: 2010/A1: 2019

Pollution degree 2

Overvoltage category (installation category) II

EMC Directive

EN61326-1: 2013 (Group1, ClassA)

RoHS Directive

EN IEC 63000: 2018

## ■ SOFTWARE

### Measurement Software CS-830

- Fully Automatic Semiconductor Static Test
- Friendly user interface
- Parameter characterization
- Temperature characteristics measurement
- Stress mode Life test and Accelerated test
- Testing multiple devices by matrix switch.

This software application performs various kinds of auto measurements through remote control of the main unit of curve tracer CS-8000 series.

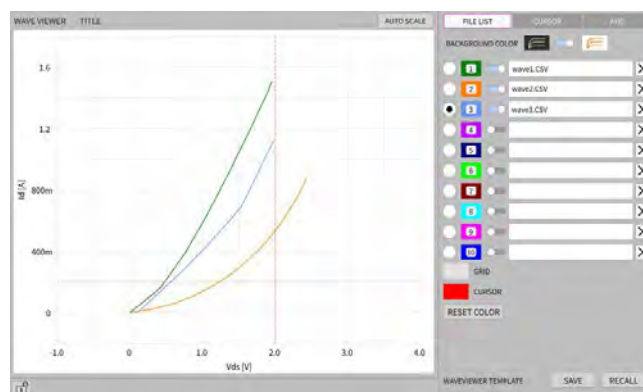
This software can execute stress test; which is difficult using traditional curve tracers, and can measure temperature characteristics of many devices, while controlling at the same time a hotplate and a thermostatic chamber.

It also can control switch matrix CS-700 series. It makes fully automatic test of multiple devices.



### Wave Viewer

The Wave Viewer enables on-screen comparison of multiple measured waveforms, including live measurement data and saved waveform data. It comes pre-installed on the CS-8000.



# CS-401 LPSMU(4W)

## LPSMU CS-401



CS-401 is a Low Power SMU (LPSMU), which can output 100V / 200mA as maximum and can be operated from the main unit. CS-401 can be used as multiple additional SMUs for Emitter sense, Temperature sensor diode, Back-gate etc.

## OUTPUT PART

| OUTPUT VOLTAGE |                    |      |           |                   |
|----------------|--------------------|------|-----------|-------------------|
| Voltage Range  | Setting Resolution | Mode | Polarity  | Max. Peak Current |
| • 100V         | 5mV                | DC   | + / -     | 40mA              |
| • 50V          | 2.5mV              | DC   | + / - / ± | 80mA              |
| • 20V          | 1mV                | DC   | + / - / ± | 200mA             |
| • 10V          | 500μV              | DC   | + / - / ± | 200mA             |
| • 5V           | 250μV              | DC   | + / - / ± | 200mA             |
| • 2V           | 100μV              | DC   | + / - / ± | 200mA             |
| • 1V           | 50μV               | DC   | + / - / ± | 200mA             |
| • 500mV        | 25μV               | DC   | + / - / ± | 200mA             |

| OUTPUT CURRENT |                    |      |           |                   |
|----------------|--------------------|------|-----------|-------------------|
| Current Range  | Setting Resolution | Mode | Polarity  | Max. Peak Voltage |
| • 200mA        | 10μA               | DC   | + / - / ± | 20V               |
| • 100mA        | 5μA                | DC   | + / - / ± | 20V               |
| • 50mA         | 2.5μA              | DC   | + / - / ± | 50V               |
| • 20mA         | 1μA                | DC   | + / - / ± | 50V               |
| • 10mA         | 500nA              | DC   | + / - / ± | 50V               |
| • 5mA          | 250nA              | DC   | + / - / ± | 50V               |
| • 2mA          | 100nA              | DC   | + / - / ± | 50V               |
| • 1mA          | 50nA               | DC   | + / - / ± | 50V               |
| • 500μA        | 25nA               | DC   | + / - / ± | 50V               |
| • 200μA        | 10nA               | DC   | + / - / ± | 50V               |
| • 100μA        | 5nA                | DC   | + / - / ± | 50V               |
| • 50μA         | 2.5nA              | DC   | + / - / ± | 50V               |
| • 20μA         | 1nA                | DC   | + / - / ± | 50V               |
| • 10μA         | 500pA              | DC   | + / - / ± | 50V               |
| • 5μA          | 250pA              | DC   | + / - / ± | 50V               |
| • 2μA          | 100pA              | DC   | + / - / ± | 50V               |
| • 1μA          | 50pA               | DC   | + / - / ± | 50V               |
| • 500nA        | 25pA               | DC   | + / - / ± | 50V               |
| • 200nA        | 10pA               | DC   | + / - / ± | 50V               |
| • 100nA        | 5pA                | DC   | + / - / ± | 50V               |
| • 50nA         | 2.5pA              | DC   | + / - / ± | 50V               |
| • 20nA         | 1pA                | DC   | + / - / ± | 50V               |
| • 10nA         | 500fA              | DC   | + / - / ± | 50V               |
| • 5nA          | 250fA              | DC   | + / - / ± | 50V               |

\*Max. voltage is 50V when polarity is set to BIPOLAR ( ± ).

## SETTING RESOLUTION

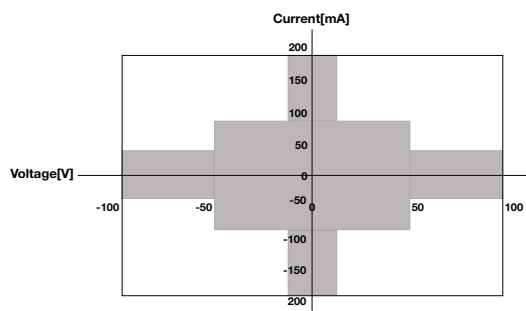
1/ ± 20000 of Set range

## SETTING ACCURACY

± (Set value × 1.2% + Set range × 0.4%)

## OUTPUT RANGE

■ LP SMU



## MEASUREMENT PART

| MEASUREMENT VOLTAGE |                    |               |                    |
|---------------------|--------------------|---------------|--------------------|
| Current Range       | Setting Resolution | Current Range | Setting Resolution |
| • 100V              | 5mV                | 10V           | 500μV              |
| • 50V               | 2.5mV              | 5V            | 250μV              |
| • 20V               | 1mV                | 10V           | 500μV              |
| • 5V                | 250μV              | 2V            | 100μV              |
| • 1V                | 50μV               | 500mV         | 25μV               |

## MEASUREMENT VOLTAGE ACCURACY

± (Measured value × 1.2%)

+ Measurement Range × 0.4%)

## DYNAMIC RANGE (MEASUREMENT VOLTAGE)

Up to 125% of the measurement range can be measured.

\* Accuracy is specified only in the measurement range.

| MEASUREMENT CURRENT |                    |               |                    |
|---------------------|--------------------|---------------|--------------------|
| Current Range       | Setting Resolution | Current Range | Setting Resolution |
| • 200mA             | 10μA               | 20μA          | 1nA                |
| • 100mA             | 5μA                | 10μA          | 500pA              |
| • 50mA              | 2.5μA              | 5μA           | 250pA              |
| • 20mA              | 1μA                | 2μA           | 100pA              |
| • 10mA              | 500nA              | 1μA           | 50pA               |
| • 5mA               | 250nA              | 500nA         | 25pA               |
| • 2mA               | 100nA              | 200nA         | 10pA               |
| • 1mA               | 50nA               | 100nA         | 5pA                |
| • 500μA             | 25nA               | 50nA          | 2.5pA              |
| • 200μA             | 10nA               | 20nA          | 1pA                |
| • 100μA             | 5nA                | 10nA          | 500fA              |
| • 50μA              | 2.5nA              | 5nA           | 250fA              |

## MEASUREMENT CURRENT ACCURACY

200mA ~ 50nA range:

± (Measured value × 1.2% + Measurement range × 0.4%)

± (Measurement range × 0.002% × Output Voltage)

20nA ~ 5nA range:

± (Measured value × 1.2% + Measurement range × 0.4%)

± (Measurement range × 0.002% × Output voltage) ± 50pA

## DYNAMIC RANGE (MEASUREMENT CURRENT)

Up to 125% of the measurement range can be measured.

\* Accuracy is specified only in the measurement range.



## POWER SOURCE

Feed from Control Interface Input.

## PHYSICAL

Dimensions (W × H × D) 424 mm × 44 mm × 220 mm  
Weight About 3 kg

## Accessory

Instruction Manua 1pcs  
Safety Cover 1set

## NOTICE

Triaxial cable CS-026 (4pcs) ,Interlock/Sense cable CS-028 (2pcs) and Control I/F cable CS-027(1pcs) are optional.

### CS-402 SEMU(4W)



CS-402 is a measurement unit for Drain current (Sense Emitter output etc.), output current of current monitor from Collector etc. Measurement Sense current at same time as Main current enables to get several parameters, which includes Diversion ratio of current sense terminal, threshold voltage and saturation voltage.

## MEASUREMENT UNIT

| MEASUREMENT CURRENT RANGE |                    |               |                    |
|---------------------------|--------------------|---------------|--------------------|
| Current Range             | Setting Resolution | Current Range | Setting Resolution |
| • 200mA                   | 10μA               | 20μA          | 1nA                |
| • 100mA                   | 5μA                | 10μA          | 500pA              |
| • 50mA                    | 2.5μA              | 5μA           | 250pA              |
| • 20mA                    | 1μA                | 2μA           | 100pA              |
| • 10mA                    | 500nA              | 1μA           | 50pA               |
| • 5mA                     | 250nA              | 500nA         | 25pA               |

※1: Up to 125% of the measurement range can be measured.

※2: Specified within the measurement range.

## MEASUREMENT CURRENT ACCURACY

± (Measured value × 1.2% + Measurement range × 0.4%)



## DYNAMIC RANGE (MEASUREMENT CURRENT)

Up to 125% of the measurement range can be measured.  
\* Accuracy is specified only in the measurement range.

## Accessory

Instruction Manua 1pcs

## PHYSICAL

Dimensions (W × H × D) 424 mm × 44 mm × 220 mm  
Weight About 2.5 kg

## NOTICE

Triaxial cable CS-026 (4pcs) ,Sense cable CS-028 (1pcs) and Control I/F cable CS-027(1pcs) are optional.

### CS-404 SENSE SELECTOR UNIT



The Sense Selector Unit enables seamless measurements when using multiple CS-8000 Series optional units, eliminating the need for rewiring or changing connections.

## POWER SOURCE

Fed from Control Interface Input.

### CS-405 POWER EXPANDER UNIT



CS-405 feeds power to other CS-8000 series optional units. If a number of using optional units is over the limit, which is from power feeding from CS-8000 Series main unit, CS-405 can expand the feeding power and the maximum number. Power is fed to each optional unit via a control cable.

## POWER SOURCE

Voltage range AC 100 ~ 240 V ± 10%

## PHYSICAL

Dimensions (W × H × D) 424 mm × 44 mm × 220 mm  
Weight About 2.5 kg

## NOTICE

Interlock/Sense cable CS-028 (2pcs) and Control I/F cable CS-027 (1pcs) are optional.

## Accessory

Instruction Manual

Frequency 50/60Hz  
Power Consumption 50 VA max

## PHYSICAL

Dimensions (W × H × D) 424 mm × 44 mm × 220 mm  
Weight About 3 kg

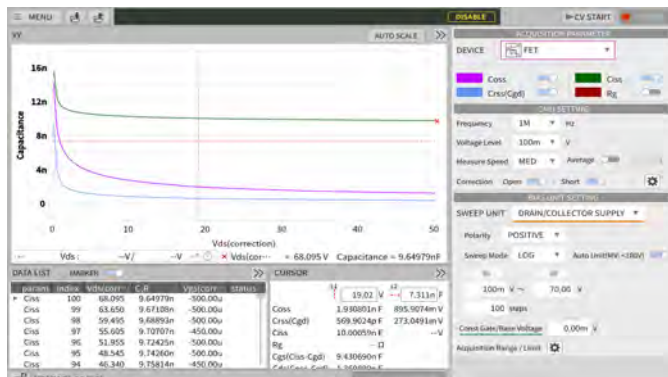
## Accessories

Instruction Manual  
Power code

## NOTICE

Control I/F cable CS-027(1pcs) is optional.

## CS-403 CMU



CS-403 provides capacitance measurement function with CS-8000 series. Main unit, CS-403 and CS-323, CS-325, CS-326 test fixture constitute High voltage CV measurement system.

### MEASUREMENT FREQUENCY

1kHz, 10kHz, 100kHz, 200kHz, 1MHz, 2MHz, 10MHz

### MEASUREMENT VOLTAGE RANGE

20 mV, 100 mV

### POWER SOURCE

Feed from Control Interface Input.

### Accessories

Instruction Manual

CV cable

CONTROL INTERFACE CABLE CS-027

### PHYSICAL

Dimensions (W × H × D) 424 mm × 44 mm × 220 mm

Weight About 2.2 kg

### MEASUREMENT ACCUTACY

Accuracy of each parameter relative to the Cgd value (Cgd : Cds : Cgs = 1 : 1 : 1)

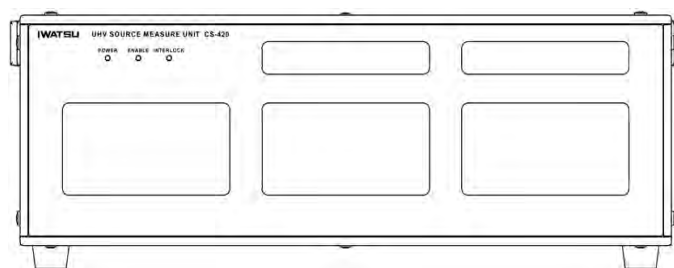
| Frequency | Level | 10pF        | 100pF        | 1nF          | 10nF | 100nF        |
|-----------|-------|-------------|--------------|--------------|------|--------------|
| 1 kHz     | 20mV  | —           |              |              |      |              |
|           | 100mV | —           | ± (5% +20pF) |              |      |              |
| 10kHz     | 20mV  | ± (5% +2pF) |              |              |      |              |
|           | 100mV | ± (5% +2pF) |              |              |      |              |
| 100kHz    | 20mV  | ± (5% +2pF) |              |              |      | ± (10% +2pF) |
|           | 100mV | ± (5% +2pF) |              |              |      | ± (10% +2pF) |
| 100kHz    | 20mV  | ± (5% +2pF) |              |              |      |              |
|           | 100mV | ± (5% +2pF) |              |              |      |              |
| 1MHz      | 20mV  | ± (5% +2pF) |              | ± (10% +2pF) |      |              |
|           | 100mV | ± (5% +2pF) |              | ± (10% +2pF) |      |              |

Accuracy of each parameter relative to the Cgd value (Cgd : Cds : Cgs = 1 : 10 : 100)

| Frequency | Level | 10pF         | 100pF        | 1nF          |
|-----------|-------|--------------|--------------|--------------|
| 1 kHz     | 20mV  | —            |              |              |
|           | 100mV | —            | ± (5% +20pF) |              |
| 10kHz     | 20mV  | ± (5% +2pF)  |              | ± (10% +2pF) |
|           | 100mV | ± (5% +2pF)  |              |              |
| 100kHz    | 20mV  | ± (5% +2pF)  |              | —            |
|           | 100mV | ± (5% +2pF)  |              | —            |
| 100kHz    | 20mV  | ± (5% +2pF)  |              |              |
|           | 100mV | ± (5% +2pF)  |              |              |
| 1MHz      | 20mV  | ± (10% +2pF) |              |              |
|           | 100mV | ± (10% +2pF) |              |              |

※ The table above shows the accuracy when the CS-403 is used in combination with the CS-323 / CS-325 / CS-326.

## ■ CS-420 series UHV UNIT



The CS-420 Series is an ultra-high-voltage SMU capable of outputting voltages up to 15 kV. This unit is operated by the main unit. Two lineup configurations are available to match the DUT (Device Under Test) to be measured.

It is ideally suited for measuring power devices used in high-speed train and power transmission and distribution applications.

### OUTPUT PART

| OUTPUT VOLTAGE (CS-420) |                    |      |          |                   |
|-------------------------|--------------------|------|----------|-------------------|
| Voltage Range           | Setting Resolution | Mode | Polarity | Max. Peak Current |
| • 10kV                  | 500mV              | DC   | +        | 20mA              |
| • 5kV                   | 250mV              | DC   | +        | 20mA              |
| • 2kV                   | 100mV              | DC   | +        | 20mA              |

| OUTPUT VOLTAGE (CS-425) |                    |      |          |                   |
|-------------------------|--------------------|------|----------|-------------------|
| Voltage Range           | Setting Resolution | Mode | Polarity | Max. Peak Current |
| • 15kV                  | 1V                 | DC   | +        | 13mA              |
| • 10kV                  | 500mV              | DC   | +        | 13mA              |
| • 5kV                   | 250mV              | DC   | +        | 13mA              |

\*Pulse is available by setting Measure Point and Measure Time.  
Rise time is >10ms fall time is >300ms.

### MEASUREMENT PART

#### MEASUREMENT VOLTAGE RANGE

20kV ~ 500V range (2/1/5step)  
(CS-420 doesn't have 20kV range.)

#### Voltage Measurement Accuracy

$\pm$  (Measured value  $\times$  1.5%+ Measurement Range  $\times$  0.5%)

#### DYNAMIC RANGE (MEASUREMENT VOLTAGE)

Up to 125% of the measurement range can be measured.  
\* Accuracy is specified only in the measurement range.

#### MEASUREMENT CURRENT RANGE

20mA ~ 50uA range (2/1/5step)  
2mA ~ 500nA range (2/1/5step) (Leakage)

#### Current Measurement Accuracy

$\pm$  (Measured value  $\times$  1.5%+ Measurement Range  $\times$  0.5%)

#### DYNAMIC RANGE (MEASUREMENT CURRENT)

Up to 125% of the measurement range can be measured.  
\* Accuracy is specified only in the measurement range.

#### POWER SOURCE

Voltage range AC 100 ~ 240 V  $\pm$  10%  
Frequency 50/60Hz  
Power Consumption TBD

#### PHYSICAL

Dimensions (W  $\times$  H  $\times$  D) 424 mm  $\times$  135 mm  $\times$  555 mm  
Weight About 15.4 kg  
Accessories Instruction Manual  
Power code

#### Accessories

Safety Cover (Rear panel) 1set  
Instruction manual 1pcs  
Power Cord with Cord Strap 1pcs

#### NOTICE

UHV cable (2pcs), Triaxial cable CS-026 (2pcs), Interlock/Sense cable CS-028 (2pcs) and Control I/F cable CS-027(1pcs) are optional.

## ■ CS-200 series HC UNIT



CS-200 (High Current Unit) is a high current SMU with a maximum current of 2000A and a maximum voltage of 40V. This unit is operated by the main unit. Three types of lineups can be selected to match the DUT to be measured.

| Model  | Max Current | Max. Peak Power |
|--------|-------------|-----------------|
| CS-220 | 2kA         | 25kW            |
| CS-210 | 1kA         | 12.5kW          |
| CS-205 | 500A        | 6.25kW          |

### OUTPUT PART

| Output Current |                    |       |          |                   |
|----------------|--------------------|-------|----------|-------------------|
| Current Range  | Setting Resolution | Mode  | Polarity | Max. Peak Voltage |
| • 2kA ※1       | 100mA              | PULSE | + / -    | 41V ※4            |
| • 1kA ※2       | 50mA               | PULSE | + / -    | 50V               |
| • 500A         | 25mA               | PULSE | + / -    | 50V               |
| • 200A         | 10mA               | PULSE | + / -    | 50V               |
| • 100A         | 5mA                | PULSE | + / -    | 50V               |
| • 50A          | 2.5mA              | PULSE | + / -    | 50V               |
| • 10A          | 1mA                | PULSE | + / -    | 50V               |
| • 5A           | 500μA              | PULSE | + / -    | 50V               |

※1: The 2kA range is available on CS-220 only.

※2: 1kA range is available on CS-220 and CS-210.

※3: Voltage setting is specified with no load.

※4 Output setting is limited to 41V only when the 2kA current range is used.

### Setting Accuracy

± (Set value × 2% + Set range × 0.1%)

### Measurement Cycle

2ms ~ 5ms

### Measurement Point

Arbitrary settings

### Pulse Width

10μs ~ 500μs (2kA • 1kA range)

10μs ~ 1ms (500 ~ 5A range)

\*When the pulse width is narrow, it may not be possible to output up to the maximum voltage/current.

### Duty Ratio

≤ 0.1 % (2 kA)

≤ 0.25 % (1 kA)

≤ 0.5 % (500 A, 200 A)

≤ 1 % (100 A ~ 5 A)

### Output Resistance

25 m Ω (2 kA Range) (Typical value)

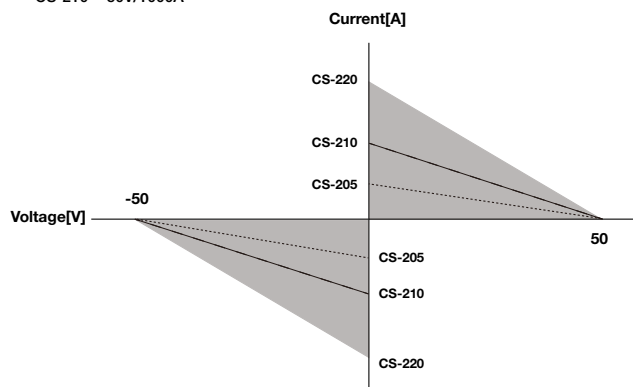
50 m Ω (1 kA Range) (Typical value)

100 m Ω (500 A Range) (Typical value)

### Output Range

#### ■ HC UNIT

..... CS-205 50V/500A    — CS-220 50V/2000A  
 --- CS-210 50V/1000A



### MEASUREMENT PART

| Measurement Voltage |                    |               |                    |
|---------------------|--------------------|---------------|--------------------|
| Voltage Range ※1    | Setting Resolution | Voltage Range | Setting Resolution |
| • 50V               | 2.5mV              | 2V            | 100μV              |
| • 20V               | 1mV                | 1V            | 50μV               |
| • 10V               | 500μV              | 500mV         | 25μV               |
| • 5V                | 250μV              | 200mV         | 10μV               |

### Current Measurement Accuracy ※2 ※3

± (Set value × 2% + Set range × 0.1%)

### Dynamic Range (Measurement voltage)

Can measure up to 125% of the measurement range.

※1: Voltage measurement is measured at MAIN UNIT (using MV SENSE terminal).

※2: Specified within the measurement range.

※3: Specified in combination with MAIN UNIT.

| Measurement Current |                    |               |                    |
|---------------------|--------------------|---------------|--------------------|
| Current Range       | Setting Resolution | Current Range | Setting Resolution |
| • 1A                | 50μA               | 50μA          | 2.5nA              |
| • 500mA             | 25μA               | 20μA          | 1nA                |
| • 200mA             | 10μA               | 10μA          | 500pA              |
| • 100mA             | 5μA                | 5μA           | 250pA              |

※1: The 2kA range is available only on the CS-220.

※2: The 1kA range is available on the CS-220 and CS-210.

### Current Measurement Accuracy

± (Set value × 2% + Set range × 0.1%) ※1 ※2

### Dynamic Range (Measurement current)

Can measure up to 125% of the measurement range.



## Power Source

Power voltage range  
AC 100 ~ 240 V  $\pm$  10%、50/60Hz

## Power Consumption

300 VA max (CS-220)  
270 VA max (CS-210/CS-205)

## Physical Characteristics

### Dimensions

424 mm x 176 mm x 556 mm (CS-220)  
424 mm x 132 mm x 556 mm (CS-210/CS-205)

### Weight

About 22kg (CS-220)  
About 21kg (CS-210/CS-205)

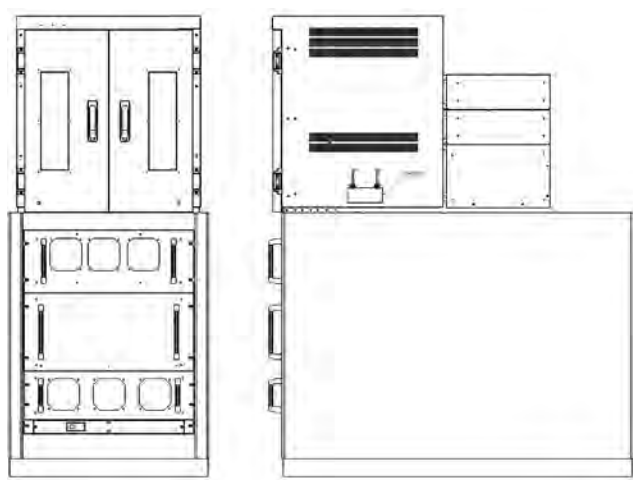
## Accessory

|                            |      |
|----------------------------|------|
| HC-FIXTURE Connection Unit | 1pcs |
| Connecting Brackets        | 4pcs |
| Power Cord                 | 1pcs |
| Cord Strap                 | 1pcs |
| Instruction Manua          | 1pcs |
| Sales Network              | 1pcs |

## Notice:

HC standard cable set CS-022 is required to connect to CS-8000.

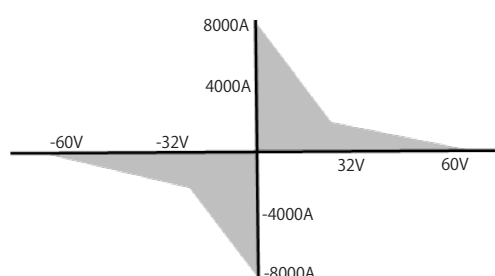
## CS-200 series UHC UNIT



CS-200 (Ultra-High Current Unit) is an ultra-high-current SMU with a maximum current of 8,000 A and a maximum voltage of 40 V. It enables evaluation of large power devices used in power transmission and distribution, railway systems, and large-scale inverters, as well as measurements such as semiconductor saturation characteristics under high current conditions. Two lineups are available to match the DUT being measured. This unit is operated by the main unit, and a test fixture is included as standard equipment. Measurement terminals for CV measurement and UHV measurement are available as options.

| Model  | Max Current | Max. Peak Power |
|--------|-------------|-----------------|
| CS-280 | 8kA         | 64kW            |
| CS-240 | 4kA         | 60kW            |

## OUTPUT RANGE



## Collector Supply specification

| Item             | Specification                                                                                                                           |                  |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------|
| MODE/POLARITY    | $\pm$ PULSE                                                                                                                             |                  |
| MAX PEAK VOLTS   | 60V (4kA) / 32V(8kA) (TBD)                                                                                                              |                  |
| MAX PEAK CURRENT | MAX PEAK POWER                                                                                                                          | MAX PEAK CURRENT |
|                  | 64kW                                                                                                                                    | 8kA              |
|                  | 60kW                                                                                                                                    | 4kA              |
|                  | 6kW                                                                                                                                     | 400A             |
|                  | 600W                                                                                                                                    | 40A              |
| PULSE WIDTH      | 500 $\mu$ s to 900 $\mu$ s (10 $\mu$ s step) (TBD)<br>Note: If the pulse width is narrow, up to max. Peak voltage may not be generated. |                  |
| PULSE INTERVAL   | 80ms to 2000ms (at 600W)<br>160ms to 2000ms (at 6kW)<br>1000ms to 2000 (at 60kW)<br>TBD (at 64kW)                                       |                  |

| Item                    | Specification                                             |
|-------------------------|-----------------------------------------------------------|
| PULSE MEASUREMENT POINT | 10 $\mu$ s to PULSE WIDTH setting value (10 $\mu$ s step) |
| DATA POINT              | 20 to 1000 point/trace                                    |

## Power Source

Power voltage range  
AC 100 ~ 240 V  $\pm$  10%、50/60Hz

## Power Consumption

TBD

## Physical Characteristics

Dimensions TBD  
Weight TBD

## ■ CS-32x series Test Fixture

### Test Fixture CS-320



This product is a test fixture designed for use with the CS-8020, capable of operating at a maximum peak voltage of 200 V and a maximum peak current of 2 A. It is useful not only for measuring the characteristics of high-voltage, high-current power devices such as the latest GaN and SiC devices, but also for evaluating the characteristics of various semiconductor devices, including transistors and diodes.

#### Rear Terminal

| Item            | Specification                   |
|-----------------|---------------------------------|
| DRAIN/COLLECTOR | 200 Vpk : FORCE, SENSE Triaxial |
| GATE/BASE       | 40 Vpk : FORCE, SENSE Triaxial  |
| SOURCE/EMITTER  | 40 Vpk : FORCE, SENSE Triaxial  |
| AUX1            | 40 Vpk : BNC                    |
| AUX2            | 40 Vpk : BNC                    |

#### Terminal inside the cover

| Item            | Specification                                      |
|-----------------|----------------------------------------------------|
| DRAIN/COLLECTOR | 200 Vpk : FORCE, SENSE<br>4 $\phi$ Banana terminal |
| GATE/BASE       | 40 Vpk : FORCE, SENSE 4 $\phi$ Banana terminal     |
| SOURCE/EMITTER  | 40 Vpk : FORCE, SENSE 4 $\phi$ Banana terminal     |
| AUX1            | 40 Vpk : 4 $\phi$ Banana terminal                  |
| AUX2            | 40 Vpk : 4 $\phi$ Banana terminal                  |
| GNDU            | : 4 $\phi$ Banana terminal                         |

#### Indicator(LED)

Interlock • ENABLE

#### Control signal

Control interface input / output

#### Interlock

External interlock (HR10 connector: 10 pins)

#### POWER SOURCE

Fed from Control Interface Input.

#### Accessories

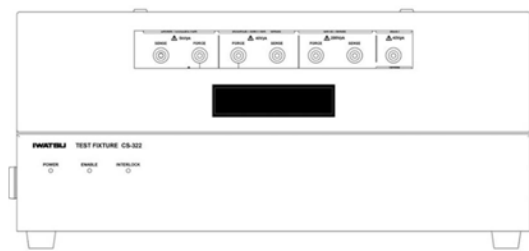
|                            |      |
|----------------------------|------|
| Standard lead set CS-005   | 1pcs |
| Safety Cover (Rear panel)  | 1set |
| Instruction manual         | 1pcs |
| Power Cord with Cord Strap | 1pcs |

note : CS-026 and CS-028 are necessary to connect with CS-8020.

#### Physical characteristics

|                      |                         |
|----------------------|-------------------------|
| Dimension(W × H × D) | : 330mm × 180mm × 370mm |
| Weight               | : About 10 kg           |

### Test Fixture CS-322



This product is a cutting-edge test fixture that operates in combination with the CS-8000 series curve tracer and the CS-200 series HC unit, supporting a maximum peak voltage of 5 kV and a maximum peak current of 2 kA. It is suitable not only for measuring the characteristics of high-voltage, high-current power devices such as the latest GaN and SiC devices, but also for evaluating the characteristics of various semiconductor devices, including transistors and diodes.

The enclosure incorporates a switch matrix for measurement circuit selection, enabling semiconductor parameter measurements to be performed without changing wiring once the DUT has been connected.

#### Rear terminal

| Item            | Specification                               |
|-----------------|---------------------------------------------|
| DRAIN/COLLECTOR |                                             |
| MIDDLE VOLTAGE  | 200 Vpk : FORCE, SENSE Triaxial             |
| HIGH VOLTAGE    | 5 kVpk : FORCE, SENSE HV terminal           |
| HIGH CURRENT    | 50 Vpk : HIGH, LOW 6 $\phi$ Banana terminal |
| GATE/BASE       | 40 Vpk : FORCE, SENSE Triaxial              |
| SOURCE/EMITTER  | 40 Vpk : FORCE, SENSE Triaxial              |
| GNDU            | : FORCE, SENSE Triaxial                     |
| AUX1            | 40 Vpk : BNC                                |
| AUX2            | 40 Vpk : BNC                                |

#### Terminal inside the cover

| Item            | Specification                                                                                          |
|-----------------|--------------------------------------------------------------------------------------------------------|
| DRAIN/COLLECTOR | 5 kVpk : FORCE 4 $\phi$ Banana terminal<br>6 $\phi$ Screw terminal<br>: SENSE 4 $\phi$ Banana terminal |
| GATE/BASE       | 200 Vpk : FOURCE, SENSE<br>4 $\phi$ Banana terminal                                                    |
| SOURCE/EMITTER  | 40 Vpk : FOURCE, SENSE<br>4 $\phi$ Banana terminal                                                     |
| AUX1            | 40 Vpk : 4 $\phi$ Banana terminal                                                                      |
| AUX2            | 40 Vpk : 4 $\phi$ Banana terminal                                                                      |
| GND             | : 4 $\phi$ Banana terminal                                                                             |

#### CONFIGURATION

Internal wiring switching function

GATE / BASE RESISTOR connection function

#### Indicator(LED)

Interlock • ENABLE

#### Control signal

Control interface input / output

#### Interlock

External interlock (HR10 connector: 10 pins)

## Power Source

|                        |                          |
|------------------------|--------------------------|
| Power Voltage Range    | AC 100 ~ 240 V $\pm$ 10% |
| Frequency              | 50/60Hz                  |
| Power line consumption | 50 VA max                |

## Physical characteristics

Dimension(W × H × D) : 424mm × 180mm × 555mm

Weight : About 10 kg

## Accessories

|                                |      |
|--------------------------------|------|
| M6 × 12 mm Phillips SEMS screw | 2pcs |
| Safety Cover (Rear panel)      | 1set |
| Instruction manual             | 1pcs |
| Power Cord with Cord Strap     | 1pcs |

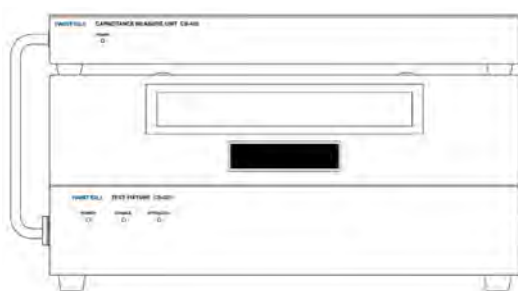
note :

CS-020(Optional) is necessary to connect with CS-8020

CS-021(Optional) is necessary to connect with CS-8200/8500.

CS-022(Optional) is necessary to connect with High Current unit (CS-200series) .

## Test Fixture CS-323



This product is a test fixture that, in addition to the functions of the CS-322, allows connection of the C-V measurement unit CS-403. It supports measurements with a maximum peak voltage of 5 kV and a maximum peak current of 2 kA, and enables high-voltage C-V measurements when used with the CS-403.

The built-in C-V measurement circuitry allows various capacitance parameters to be measured without changing wiring.

## Rear terminal

| Item                   | Specification                               |
|------------------------|---------------------------------------------|
| DRAIN/COLLECTOR        |                                             |
| MIDDLE VOLTAGE         | 200 Vpk : FORCE, SENSE Triaxial             |
| HIGH VOLTAGE           | 5 kVpk : FORCE, SENSE HV terminal           |
| HIGH CURRENT           | 50 Vpk : HIGH, LOW 6 $\phi$ Banana terminal |
| GATE/BASE              | 40 Vpk : FORCE, SENSE Triaxial              |
| SOURCE/EMITTER         | 40 Vpk : FORCE, SENSE Triaxial              |
| GNDU                   | : FORCE, SENSE Triaxial                     |
| LCUR, LPOT, HPOT, HCUR | Connect to LCR meter through CV CABLE       |
| J1 TERMINAL            | Detects if CV CABLE is properly installed   |
| AUX1                   | 40 Vpk : BNC                                |
| AUX2                   | 40 Vpk : BNC                                |

## Terminal inside the cover

| Item                        | Specification                                                                                          |
|-----------------------------|--------------------------------------------------------------------------------------------------------|
| DRAIN/COLLECTOR             | 5 kVpk : FORCE 4 $\phi$ Banana terminal<br>6 $\phi$ Screw terminal<br>: SENSE 4 $\phi$ Banana terminal |
| GATE/BASE                   | 200 Vpk : FOURCE, SENSE<br>4 $\phi$ Banana terminal                                                    |
| SOURCE/EMITTER              | 40 Vpk : FOURCE, SENSE<br>4 $\phi$ Banana terminal                                                     |
| CV                          |                                                                                                        |
| DRAIN/COLLECTOR/<br>CATHODE | 5 kVpk : SHV-Banana cable                                                                              |
| SOURCE/EMITTER/ANODE        | 40 Vpk : BNC-Banana cable                                                                              |
| GATE/BASE                   | 40 Vpk : BNC-Banana cable                                                                              |
| AUX1                        | 40 Vpk : 4 $\phi$ Banana terminal                                                                      |
| AUX2                        | 40 Vpk : 4 $\phi$ Banana terminal                                                                      |
| GND                         | : 4 $\phi$ Banana terminal                                                                             |

## CONFIGURATION

Internal wiring switching function

GATE / BASE RESISTOR connection function

## Indicator(LED)

Interlock • ENABLE

## Control signal

Control interface input / output

## Interlock

External interlock (HR10 connector: 10 pins)

## Power Source

|                        |                          |
|------------------------|--------------------------|
| Power Voltage Range    | AC 100 ~ 240 V $\pm$ 10% |
| Frequency              | 50/60Hz                  |
| Power line consumption | 50 VA max                |

## Accessories

|                                |      |
|--------------------------------|------|
| Standard lead set CS-005       | 1pcs |
| HV/HC Cable CS-006             | 1pcs |
| SHV test lead (Red)            | 1pcs |
| BNC test lead (Black)          | 2pcs |
| Mini Alligator clip (Red)      | 1pcs |
| Mini Alligator clip (Black)    | 2pcs |
| M6 × 12 mm Phillips SEMS screw | 2pcs |
| Safety Cover (Rear panel)      | 1set |
| Instruction manual             | 1pcs |
| Power Cord with Cord Strap     | 1pcs |

note :

CS-020(Optional) is necessary to connect with CS-8020

CS-021(Optional) is necessary to connect with CS-8200/8500.

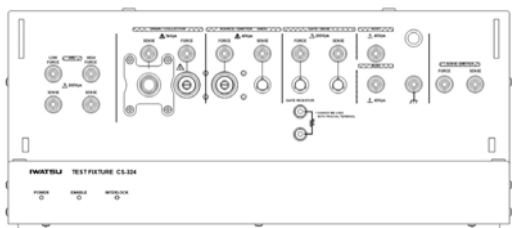
CS-022(Optional) is necessary to connect with High Current unit (CS-200series) .

## Physical characteristics

Dimension(W × H × D) : 424mm × 180mm × 555mm

Weight About 10 kg

Test Fixture CS-324



This product is a unit designed for use with the CS-8000 Series and is intended to connect to probe systems, the CS-700 Series scanner system, or test fixtures manufactured by other companies. When used in combination with a CS-8000 Series curve tracer and a CS-200 Series HC unit, it supports measurements with peak voltages of up to 5 kV and peak currents of up to 2 kA. The CS-324 is equipped with dedicated connection terminals for interfacing with the CS-401 and CS-402.

Rear terminal

| Item            | Specification                          |
|-----------------|----------------------------------------|
| DRAIN/COLLECTOR |                                        |
| MIDDLE VOLTAGE  | 200 Vpk : FORCE, SENSE Triaxial        |
| HIGH VOLTAGE    | 5 kVpk : FORCE, SENSE HV terminal      |
| HIGH CURRENT    | 50 Vpk : HIGH, LOW 6 φ Banana terminal |
| GATE/BASE       | 40 Vpk : FORCE, SENSE Triaxial         |
| SMU             | 200 Vpk : FORCE, SENSE Triaxial        |
| SOURCE/EMITTER  | 40 Vpk : FORCE, SENSE Triaxial         |
| GNDU            | : FORCE, SENSE Triaxial                |
| AUX1            | 40 Vpk : BNC                           |
| AUX2            | 40 Vpk : BNC                           |

Terminal inside the cover

| Item            | Specification                                                                           |
|-----------------|-----------------------------------------------------------------------------------------|
| DRAIN/COLLECTOR | 5 kVpk : FORCE 4 φ Banana terminal<br>6 φ Screw terminal<br>: SENSE 4 φ Banana terminal |
| GATE/BASE       | 200 Vpk : FOURCE, SENSE<br>4 φ Banana terminal<br>Triaxial                              |
| SOURCE/EMITTER  | 40 Vpk : FOURCE, SENSE<br>4 φ Banana terminal<br>Triaxial                               |
| SMU             | 200 Vpk : FOURCE, SENSE<br>4 φ Banana terminal                                          |
| AUX1            | 40 Vpk : 4 φ Banana terminal                                                            |
| AUX2            | 40 Vpk : 4 φ Banana terminal                                                            |
| GND             | : 4 φ Banana terminal                                                                   |

CONFIGURATION

Internal wiring switching function  
GATE / BASE RESISTOR connection function

Indicator(LED)

Interlock • ENABLE

Control signal

Control interface input / output

Interlock

External interlock (HR10 connector: 10 pins)

Power Source

|                        |                      |
|------------------------|----------------------|
| Power Voltage Range    | AC 100 ~ 240 V ± 10% |
| Frequency              | 50/60Hz              |
| Power line consumption | 50 VA max            |

Physical characteristics

|                  |                         |
|------------------|-------------------------|
| Dimension(W×H×D) | 424mm × 180mm × 374.5mm |
| Weight           | About 8 kg              |

Accessories

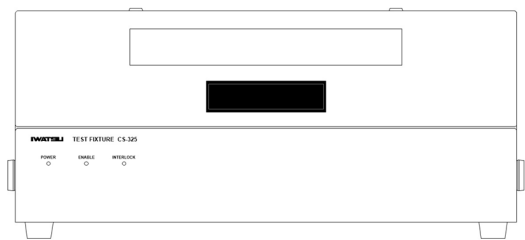
|                                |      |
|--------------------------------|------|
| M6 × 12 mm Phillips SEMS screw | 2pcs |
| Safety Cover (Rear panel)      | 1set |
| Instruction manual             | 1pcs |
| Power Cord with Cord Strap     | 1pcs |

note :

CS-020(Optional) is necessary to connect with CS-8020  
CS-021(Optional) is necessary to connect with CS-8200/8500.  
CS-022(Optional) is necessary to connect with High Current unit (CS-200series) .



# Test Fixture CS-325



This product is a state-of-the-art test fixture that, when used in combination with the CS-8000 Series curve tracer and the CS-200 Series HC unit, is capable of operation at a maximum peak voltage of 5 kV and a maximum peak current of 2 kA. It is suitable not only for evaluating the characteristics of high-voltage, high-current power devices such as the latest IGBTs and power MOSFETs, but also for measuring the characteristics of a wide range of semiconductor devices including transistors and diodes. By simply placing the device under test inside the cover of the test fixture and making the basic connections, measurements can be performed while the CS-8000 Series automatically switches the connection to the applied power supply for each circuit to be measured, based on commands from the CS-8000 Series. The Test Fixture CS-325 is equipped with dedicated connection terminals for use with the CS-401 and CS-402.

## Rear terminal

| Item            | Specification                          |
|-----------------|----------------------------------------|
| DRAIN/COLLECTOR |                                        |
| MIDDLE VOLTAGE  | 200 Vpk : FORCE, SENSE Triaxial        |
| HIGH VOLTAGE    | 5 kVpk : FORCE, SENSE HV terminal      |
| HIGH CURRENT    | 50 Vpk : HIGH, LOW 6 φ Banana terminal |
| GATE/BASE       | 40 Vpk : FORCE, SENSE Triaxial         |
| SMU             | 200 Vpk : FORCE, SENSE Triaxial        |
| SOURCE/EMITTER  | 40 Vpk : FORCE, SENSE Triaxial         |
| GNDU            | : FORCE, SENSE Triaxial                |
| AUX1            | 40 Vpk : BNC                           |
| AUX2            | 40 Vpk : BNC                           |

## Terminal inside the cover

| Item            | Specification                                                                           |
|-----------------|-----------------------------------------------------------------------------------------|
| DRAIN/COLLECTOR | 5 kVpk : FORCE 4 φ Banana terminal<br>6 φ Screw terminal<br>: SENSE 4 φ Banana terminal |
| GATE/BASE       | 200 Vpk : FORCE, SENSE<br>4 φ Banana terminal                                           |
| SOURCE/EMITTER  | 40 Vpk : FORCE, SENSE<br>4 φ Banana terminal                                            |
| SMU             | 200 Vpk : FORCE, SENSE<br>4 φ Banana terminal                                           |
| AUX1            | 40 Vpk : 4 φ Banana terminal                                                            |
| AUX2            | 40 Vpk : 4 φ Banana terminal                                                            |
| GND             | : 4 φ Banana terminal                                                                   |

## CONFIGURATION

Internal wiring switching function

GATE / BASE RESISTOR connection function

Indicator(LED)

Interlock • ENABLE

## Control signal

Control interface input / output

## Interlock

External interlock (HR10 connector: 10 pins)

## Power Source

Power Voltage Range AC 100 ~ 240 V ± 10%

Frequency 50/60Hz

Power line consumption 50 VA max

## Physical characteristics

Dimension(W × H × D) 424mm × 180mm × 555mm

Weight About 9 kg

## Accessories

M6 × 12 mm Phillips SEMS screw 2pcs

Safety Cover (Rear panel) 1set

Instruction manual 1pcs

Power Cord with Cord Strap 1pcs

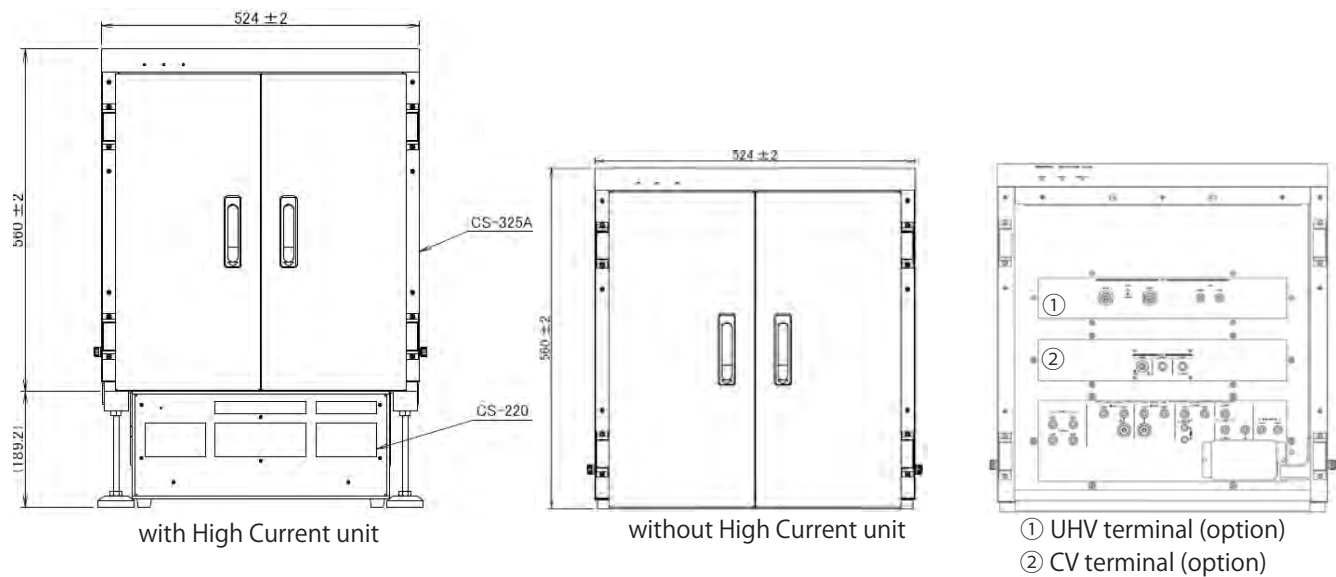
note :

CS-020(Optional) is necessary to connect with CS-8020

CS-021(Optional) is necessary to connect with CS-8200/8500.

CS-022(Optional) is necessary to connect with High Current unit (CS-200series) .

Test Fixture CS-326



This product is a large-capacity test fixture that offers the same basic specifications as the CS-325. It is equipped as standard with dedicated connection terminals for use with the CS-401 and CS-402. In addition, when using the CMU unit CS-403 or the UHV units CS-420/425, dedicated connection terminals can be added as optional configurations.

Rear terminal

| Item            | Specification                          |
|-----------------|----------------------------------------|
| DRAIN/COLLECTOR |                                        |
| MIDDLE VOLTAGE  | 200 Vpk : FORCE, SENSE Triaxial        |
| HIGH VOLTAGE    | 5 kVpk : FORCE,SENSE HV terminal       |
| HIGH CURRENT    | 50 Vpk : HIGH, LOW 6 φ Banana terminal |
| GATE/BASE       | 40 Vpk : FORCE, SENSE Triaxial         |
| SMU             | 200 Vpk : FORCE, SENSE Triaxial        |
| SOURCE/EMITTER  | 40 Vpk : FORCE, SENSE Triaxial         |
| GNDU            | : FORCE, SENSE Triaxial                |
| AUX1            | 40 Vpk : BNC                           |
| AUX2            | 40 Vpk : BNC                           |

Terminal inside the cover

| Item            | Specification                                                                           |
|-----------------|-----------------------------------------------------------------------------------------|
| DRAIN/COLLECTOR | 5 kVpk : FORCE 4 φ Banana terminal<br>6 φ Screw terminal<br>: SENSE 4 φ Banana terminal |
| GATE/BASE       | 200 Vpk : FOURCE, SENSE<br>4 φ Banana terminal                                          |
| SOURCE/EMITTER  | 40 Vpk : FOURCE, SENSE<br>4 φ Banana terminal                                           |
| SMU             | 200 Vpk : FOURCE, SENSE<br>4 φ Banana terminal                                          |
| AUX1            | 40 Vpk : 4 φ Banana terminal                                                            |
| AUX2            | 40 Vpk : 4 φ Banana terminal                                                            |
| GND             | : 4 φ Banana terminal                                                                   |

CONFIGURATION

Internal wiring switching function  
GATE / BASE RESISTOR connection function

Indicator(LED)

Interlock・ENABLE

Control signal

Control interface input / output

Interlock

External interlock (HR10 connector: 10 pins)

Power Source

|                        |                      |
|------------------------|----------------------|
| Power Voltage Range    | AC 100 ~ 240 V ± 10% |
| Frequency              | 50/60Hz              |
| Power line consumption | 50 VA max            |

Physical characteristics

|                  |                       |
|------------------|-----------------------|
| Dimension(W×H×D) | 424mm × 180mm × 555mm |
| Weight           | About 11 kg           |

Accessories

|                                |      |
|--------------------------------|------|
| Standard lead set CS-005       | 1pcs |
| HV/HC Cable CS-006             | 1pcs |
| M6 × 12 mm Phillips SEMS screw | 2pcs |
| Safety Cover (Rear panel)      | 1set |
| Legs (When using CS-200 )      | 2pcs |
| Instruction manual             | 1pcs |
| Power Cord with Cord Strap     | 1pcs |

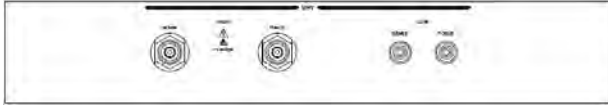
note :

CS-020(Optional) is necessary to connect with CS-8020  
CS-021(Optional) is necessary to connect with CS-8200/8500  
CS-022(Optional) is necessary to connect with High Current unit (CS-200series) .

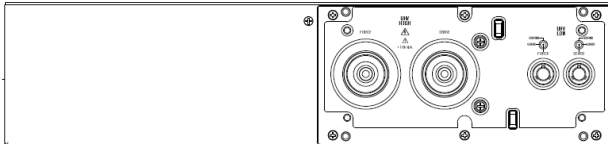
Power outlet in fixture is optional. Please ask it to our sales distributor.

## UHV terminal option

## Front Panel



## Rear Panel



This option is intended for use with the Test Fixture CS-326 or the UHC units CS-240 and CS-280. When using the UHV units CS-420 or CS-425, it allows dedicated measurement terminals to be added inside the fixture.

## Rear terminal

| Item     | Specification                         |
|----------|---------------------------------------|
| UHV      |                                       |
| UHV HIGH | 15kVpk : FOURCE, SENSE(UHV connecors) |
| UHV LOW  | : FORCE,SENSE(triaxial)               |

## UHV CONNECTOR

Rear Panel GB125 Pro (HIGH) / TRIAXIAL (LOW)

Front Panel      HB21 (HIGH) / 4mmSAFTY PLUG (LOW)

## CV terminal option



This option is intended for use with the Test Fixture CS-326 or the UHC units CS-240 and CS-280. When used with the CV unit CS-403, it allows dedicated measurement terminals to be added inside the fixture. The electrical specifications are the same as those of the CV section of the CS-323.

Note. Maximum Bias Voltage is 5 kV.

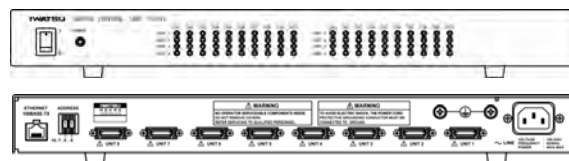
## Fixture Lineup

| Tyoe   | HV | HC | MV | GATE | LPSMU | SEMU | CV       | UHV      |
|--------|----|----|----|------|-------|------|----------|----------|
| CS-320 |    |    | ○  | ○    |       |      |          |          |
| CS-322 | ○  | ○  | ○  | ○    |       |      |          |          |
| CS-323 | ○  | ○  | ○  | ○    |       |      | ○        |          |
| CS-324 | ○  | ○  | ○  | ○    | ○     | ○    |          |          |
| CS-325 | ○  | ○  | ○  | ○    | ○     | ○    |          |          |
| CS-326 | ○  | ○  | ○  | ○    | ○     | ○    | Optional | Optional |



The scanner system CS-700, when used in combination with the semiconductor curve tracer CS-8000, enables automatic measurement of multiple devices. It automates the reconnection of individual chips in multi-chip semiconductor devices, such as multiple discrete semiconductors and power devices in 6-in-1 or 2-in-1 packages, as well as the switching between multiple devices. The semiconductor parameter measurement software CS-830 (installed on an external PC) controls each relay unit to automate terminal connection switching. By controlling not only the main instrument and relay units but also temperature chambers and hot plates, CS-830 also enables fully automated measurement of the temperature characteristics of each chip in a 6-in-1 module.

## Switch Control Unit CS-701



The Switch Control Unit CS-701 is a unit that provides centralized control of all units used in the scanner system via an application running on a personal computer connected through a LAN. The CS-701 is an essential unit for operation of the CS-700 scanner system. A single CS-701 can control up to eight units. In addition, parallel operation using two or more CS-701 units is possible by assigning an ADDRESS on the rear panel of each unit. If the number of units to be controlled exceeds eight, please use parallel operation. The ADDRESS is set on the rear panel of this unit.

### Connectors

|                                           |   |
|-------------------------------------------|---|
| Unit Control Connector                    | 8 |
| ETHERNET (10 Base-T/100 Base-TX Ethernet) | 1 |

### Physical characteristics

|                  |                        |
|------------------|------------------------|
| Dimension(W×H×D) | 436mm × 43mm × 450.5mm |
| Weight           | About 3.6 kg           |

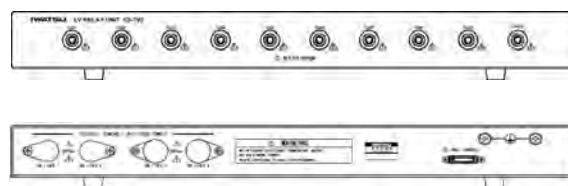
### Power Source

|                        |                      |
|------------------------|----------------------|
| Power Voltage Range    | AC 100 ~ 240 V ± 10% |
| Frequency              | 50/60Hz              |
| Power line consumption | 40 VA max            |

### Accessories

|                            |      |
|----------------------------|------|
| Instruction manual         | 1pcs |
| Power Cord with Cord Strap | 1pcs |

## LV Relay Unit CS-702A



The LV Relay Unit CS-702A, when controlled by the Switch Control Unit CS-701, enables flexible routing of the input and output signals of the CS-3000 / CS-5000 / CS-8000 Series Curve Tracers to each channel (CH1 to CH10).

The CS-702 supports a maximum applied voltage and current of 300 V and 30 A, respectively.

It is optimized for use with the collector (drain), base (gate), and emitter (source) signals in the 30 V and 300 V operating modes of the CS-3000 / CS-5000 Series curve tracers.

The number of switchable output terminals can be expanded by daisy-chain connection of multiple CS-702 units via the rear-panel IN/OUT connectors.



## Front Panel

| Item                   | Specification                          |
|------------------------|----------------------------------------|
| Connector              | 10 Channels (4 $\phi$ Banana terminal) |
| MAXIMUM VOLTAGE (PEAK) | 300 Vpk                                |
| MAXIMUM CURRENT (PEAK) | 7.5 A (AC, DC), 30 A (Pulse)           |

## Rear Panel

| Item                   | Specification                                                   |
|------------------------|-----------------------------------------------------------------|
| Connector (In/Out)     | 2 Channels (4 $\phi$ Banana terminal)<br>2 Channels (Triaxial ) |
| MAXIMUM VOLTAGE (PEAK) | 300 Vpk                                                         |
| MAXIMUM CURRENT (PEAK) | 7.5 A (AC, DC), 30 A (Pulse)                                    |

## Connectors

Unit Control Connector 1

## Physical characteristics

Dimension(W × H × D) 436mm × 43mm × 450.5mm

Weight About 3.2 kg

## Power Source

Power is supplied from the CS-701

## Accessories

Instruction manual 1pcs

## HC Relay Unit CS-704A

## Connectors

Unit Control Connector 1

## Physical characteristics

Dimension(W × H × D) 436mm × 43mm × 450.5mm

Weight About 3.2 kg

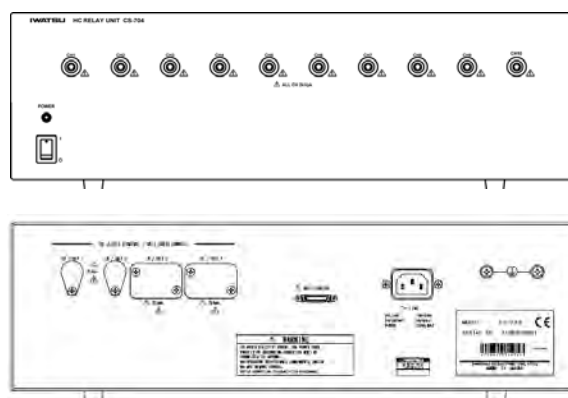
## Power Source

Power is supplied from the CS-701

## Accessories

Instruction manual 1pcs

## HC Relay Unit CS-704A



The HC Relay Unit CS-704A, when controlled by the Switch Control Unit CS-701, enables flexible routing of the input and output signals of the CS-3000 / CS-5000 / CS-8000 Series Curve Tracers to each channel (CH1 to CH10).

The CS-704A supports a maximum applied voltage and current of 2 kV and 1500 A, respectively.

It is optimized for use with the collector (drain) and emitter (source) signals in the HC mode of the CS-3000 / CS-5000 / CS-8000 Series Curve Tracers.

The number of switchable output terminals can be expanded by daisy-chain connection of multiple CS-704A units via the rear-panel IN/OUT connectors.

The HV Relay Unit CS-703A, when controlled by the Switch Control Unit CS-701, enables flexible routing of the input and output signals of the CS-3000 / CS-5000 / CS-8000 Series Curve Tracers to each channel (CH1 to CH10).

The CS-703A supports a maximum applied voltage and current of 5 kV and 0.5 A, respectively.

It is suitable for use with the collector (drain) signals in the 2 kV and 5 kV operating modes of the CS-8000 Series Curve Tracers, as well as with the high-side gate of 2-in-1 devices. The number of switchable output terminals can be expanded by daisy-chain connection of multiple CS-703A units via the rear-panel IN/OUT connectors.

## Front Panel

| Item                   | Specification                          |
|------------------------|----------------------------------------|
| Connector              | 10 Channels (4 $\phi$ Banana terminal) |
| MAXIMUM VOLTAGE (PEAK) | 5 kV                                   |
| MAXIMUM CURRENT (PEAK) | 0.5 A                                  |

## Rear Panel

| Item                   | Specification                                                  |
|------------------------|----------------------------------------------------------------|
| Connector (In/Out)     | 2 Channels(4 $\phi$ Banana terminal)<br>2 Channels (Triaxial ) |
| MAXIMUM VOLTAGE (PEAK) | 5 kVpk                                                         |
| MAXIMUM CURRENT (PEAK) | 0.5 A                                                          |

## Front Panel

| Item                   | Specification                         |
|------------------------|---------------------------------------|
| Connector              | 10 Channels(4 $\phi$ Banana terminal) |
| MAXIMUM VOLTAGE (PEAK) | 2 kV                                  |
| MAXIMUM CURRENT (PEAK) | 7.5 A (AC, DC), 1500 A (Pulse)        |

## Rear Panel

| Item                   | Specification                                                                 |
|------------------------|-------------------------------------------------------------------------------|
| Connector (In/Out)     | 2 Channels (4 $\phi$ Banana terminal)<br>2 Channels (6 $\phi$ Screw terminal) |
| MAXIMUM VOLTAGE (PEAK) | 2 kVpk                                                                        |
| MAXIMUM CURRENT (PEAK) | 7.5 A (AC, DC), 1500 A (Pulse)                                                |

## Connectors

Unit Control Connector 1

## Physical characteristics

Dimension(W × H × D) 436mm × 130mm × 450.5mm

Weight About 12 kg

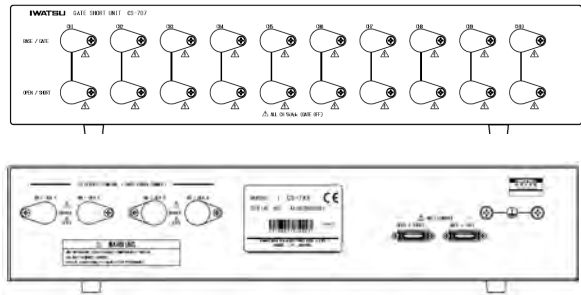
Power Source

|                        |                      |
|------------------------|----------------------|
| Power Voltage Range    | AC 100 ~ 240 V ± 10% |
| Frequency              | 50/60Hz              |
| Power line consumption | 40 VA max            |

Accessories

|                    |      |
|--------------------|------|
| Instruction manual | 1pcs |
|--------------------|------|

Gate Short Unit CS-707A



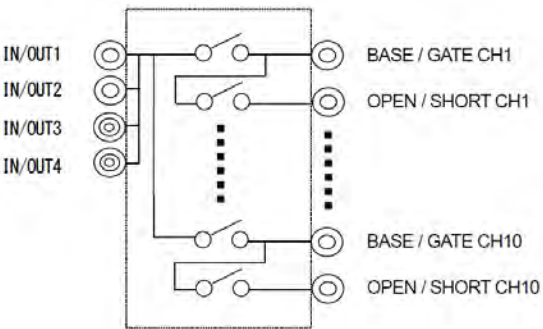
The Gate Short Unit CS-707 is a control unit that enables flexible routing and short-circuit control of signals from the CS-3000 / CS-5000 / CS-8000 Series Curve Tracers to multiple channels (CH1 to CH10) when operated under the control of the Switch Control Unit CS-701A.

In addition to signal switching, the CS-707 provides dedicated terminals for short-circuiting between channels, allowing safe and reliable short connections.

The CS-707 is designed for applications requiring gate–emitter or gate–collector shorting, making it well suited for a wide range of semiconductor device evaluations.

Multiple CS-707 units can be daisy-chained via the rear-panel IN/OUT connectors to increase the number of switchable output channels, supporting scalable measurement configurations.

Note: Control of the CS-707 requires two control channels when operated via the CS-701A.



Front Panel

| Item                   | Specification                                                                                                                                                                                      |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Connector              | 10 Channels (4 φ Banana terminal)                                                                                                                                                                  |
| MAXIMUM VOLTAGE (PEAK) | GATE / BASE ON : 300 V<br>OFF : 5 kV<br>OPEN / SHORT<br>Standard condition: 5 kV<br>Exception: 300 V under the following conditions:<br>GATE / BASE: ON, and<br>OPEN / SHORT: ON (SHORT condition) |
| MAXIMUM CURRENT (PEAK) | 7.5 A (AC/DC)、15 A (Pulse)                                                                                                                                                                         |

Rear Panel

| Item                   | Specification                                             |
|------------------------|-----------------------------------------------------------|
| Connector (In/Out)     | 2 Channels(4 φ Banana terminal)<br>2 Channels (Triaxial ) |
| MAXIMUM VOLTAGE (PEAK) | 300 kVpk                                                  |
| MAXIMUM CURRENT (PEAK) | 0.5 A                                                     |

Connectors

|                        |   |
|------------------------|---|
| Unit Control Connector | 2 |
|------------------------|---|

Physical characteristics

|                  |                          |
|------------------|--------------------------|
| Dimension(W×H×D) | 436mm × 87.5mm × 450.5mm |
| Weight           | About 4kg                |

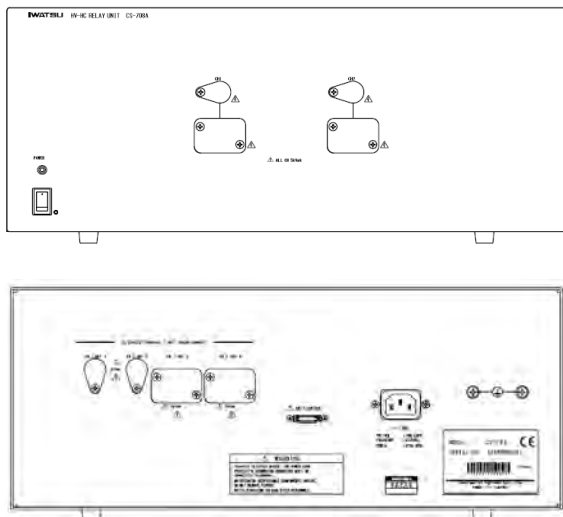
Power Source

Power is supplied from the CS-701

Accessories

|                    |      |
|--------------------|------|
| Instruction manual | 1pcs |
|--------------------|------|

## HC Relay Unit CS-708A



The HC Relay Unit CS-708A, when controlled by the Switch Control Unit CS-701, enables flexible routing of the input and output signals of the CS-3000 / CS-5000 / CS-8000 Series Curve Tracers to each channel (CH1 to CH2).

The CS-708A supports a maximum applied voltage and current of 5 kV and 1500 A, respectively.

It is optimized for use with the collector (drain) and emitter (source) signals in the HC mode of the CS-3000 / CS-5000 / CS-8000 Series Curve Tracers.

The number of switchable output terminals can be expanded by daisy-chain connection of multiple CS-708A units via the rear-panel IN/OUT connectors.

### Front Panel

| Item                   | Specification                                                                              |
|------------------------|--------------------------------------------------------------------------------------------|
| Connector              | 2 Channels(4 $\varnothing$ Banana terminal)<br>2 Channels (6 $\varnothing$ Screw terminal) |
| MAXIMUM VOLTAGE (PEAK) | 5 kV                                                                                       |
| MAXIMUM CURRENT (PEAK) | 7.5 A (AC, DC)、1500 A (Pulse)                                                              |

### Rear Panel

| Item                   | Specification                                                                               |
|------------------------|---------------------------------------------------------------------------------------------|
| Connector (In/Out)     | 2 Channels (4 $\varnothing$ Banana terminal)<br>2 Channels (6 $\varnothing$ Screw terminal) |
| MAXIMUM VOLTAGE (PEAK) | 5 kVpk                                                                                      |
| MAXIMUM CURRENT (PEAK) | 7.5 A (AC, DC)、1500 A (Pulse)                                                               |

### Connectors

Unit Control Connector 1

### Physical characteristics

Dimension(W × H × D) 436mm × 175mm × 450.5mm  
Weight About 9 kg

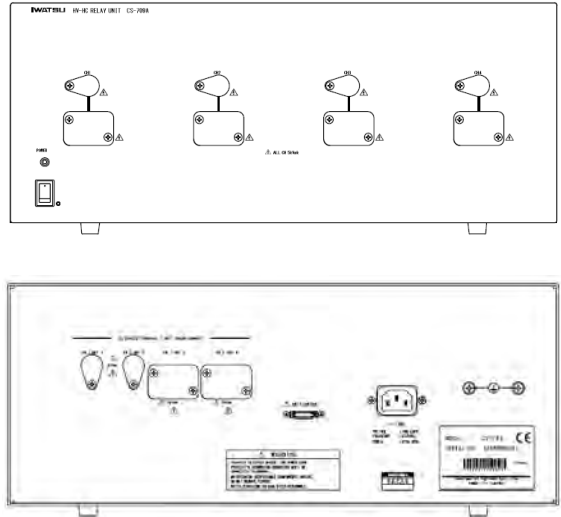
### Power Source

Power Voltage Range AC 100 ~ 240 V  $\pm$  10%  
Frequency 50/60Hz  
Power line consumption 60 VA max

### Accessories

Instruction manual 1pcs

## HC Relay Unit CS-709A



The HC Relay Unit CS-709A, when controlled by the Switch Control Unit CS-701, enables flexible routing of the input and output signals of the CS-3000 / CS-5000 / CS-8000 Series Curve Tracers to each channel (CH1 to CH4).

The CS-709A supports a maximum applied voltage and current of 5 kV and 1500 A, respectively.

It is optimized for use with the collector (drain) and emitter (source) signals in the HC mode of the CS-3000 / CS-5000 / CS-8000 Series Curve Tracers.

The number of switchable output terminals can be expanded by daisy-chain connection of multiple CS-709A units via the rear-panel IN/OUT connectors.

### Front Panel

| Item                   | Specification                                                                              |
|------------------------|--------------------------------------------------------------------------------------------|
| Connector              | 4 Channels(4 $\varnothing$ Banana terminal)<br>4 Channels (6 $\varnothing$ Screw terminal) |
| MAXIMUM VOLTAGE (PEAK) | 5 kV                                                                                       |
| MAXIMUM CURRENT (PEAK) | 7.5 A (AC, DC)、1500 A (Pulse)                                                              |

### Rear Panel

| Item                   | Specification                                                                               |
|------------------------|---------------------------------------------------------------------------------------------|
| Connector (In/Out)     | 2 Channels (4 $\varnothing$ Banana terminal)<br>2 Channels (6 $\varnothing$ Screw terminal) |
| MAXIMUM VOLTAGE (PEAK) | 5 kVpk                                                                                      |
| MAXIMUM CURRENT (PEAK) | 7.5 A (AC, DC)、1500 A (Pulse)                                                               |

### Connectors

Unit Control Connector 1

### Physical characteristics

Dimension(W × H × D) 436mm × 175mm × 450.5mm  
Weight About 11 kg

### Power Source

Power Voltage Range AC 100 ~ 240 V  $\pm$  10%  
Frequency 50/60Hz  
Power line consumption 80 VA max

### Accessories

Instruction manual 1pcs

## ■ Accessory

### Option cable

The cable will be required when connecting with HC unit, test fixture and CS-8000.

| Cable set                                                | Model  | Item                                              |
|----------------------------------------------------------|--------|---------------------------------------------------|
| CS-020<br>MV Standard cable set (for CS-320)             | CS-026 | Triaxial cable (L=1.0m) 7                         |
|                                                          | CS-027 | Control I/F cable (L=1.0m) 1                      |
|                                                          | CS-028 | Interlock/Sense cable(L=1.0m) 1                   |
| CS-021<br>HV Standard cable set (for CS-322)             | CS-025 | HV cable(L=1.0m) 2                                |
|                                                          | CS-026 | Triaxial cable (L=1.0m) 7                         |
|                                                          | CS-027 | Control I/F cable (L=1.0m) 1                      |
| CS-022<br>HC Standard cable set (for HC unit)            | CS-028 | Interlock/Sense cable(L=1.0m) 1                   |
|                                                          | CS-027 | Control I/F cable (L=1.0m) 1                      |
|                                                          | CS-028 | Interlock/Sense cable(L=1.0m) 1                   |
| CS-029<br>LPSMU Standard cable set (for CS-401)          | CS-026 | Triaxial cable (L=1.0m) 4                         |
|                                                          | CS-027 | Control I/F cable (L=1.0m) 1                      |
|                                                          | CS-028 | Interlock/Sense cable(L=1.0m) 2                   |
| CS-030<br>SEMU Standard cable set (for CS-402)           | CS-026 | Triaxial cable (L=1.0m) 4                         |
|                                                          | CS-027 | Control I/F cable (L=1.0m) 1                      |
|                                                          | CS-028 | Interlock/Sense cable(L=1.0m) 1                   |
| CS-031<br>SENSE SELECTOR Standard cable set (for CS-404) | CS-027 | Control I/F cable (L=1.0m) 1                      |
|                                                          | CS-028 | Interlock/Sense cable(L=1.0m) 2                   |
| CS-034<br>UHV Standard cable set (for CS-420/CS-425)     | CS-026 | Triaxial cable (L=1.0m) 2                         |
|                                                          | CS-027 | Control I/F cable (L=1.0m) 2                      |
|                                                          | CS-028 | Interlock/Sense cable(L=1.0m) 1                   |
|                                                          | CS-033 | UHV cable ( UHV connector : KS125Pro both side) 2 |



CS-025  
HV cable



CS-026  
Triaxial Cable



CS-027  
Control I/F cable



CS-028  
Interlock/Sense cable

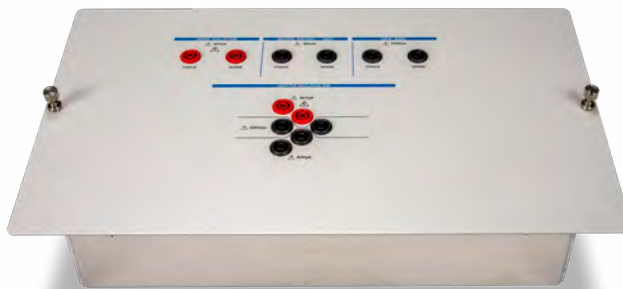


CS-034  
UHV Cable

| Measurement Cable               | Model  | Item                                                     |    |
|---------------------------------|--------|----------------------------------------------------------|----|
| Small crocodile clip            | CS-001 | Red                                                      | 10 |
|                                 | CS-002 | Black                                                    | 10 |
| High voltage wire red 5 pcs set | CS-003 | High Voltage Test Wire ( Red )                           | 5  |
| Wire black 5 pcs set            | CS-004 | Test Wire ( Black )                                      | 5  |
| Standard lead set               | CS-005 | This lead set that is a standard accessory of main unit. | 1  |
| HC cable                        | CS-006 | Cables for high current 20cm ( Black and Blue 1pcs each) | 1  |
|                                 | CS-007 | Cables for high current 30cm ( Black and Blue 1pcs each) | 1  |

## CS-520 Patch panel

It does not come with CS-32x test fixture.



Adaptor installation image

## Adapter CS-500 series

Installation to test fixture and patch panel.

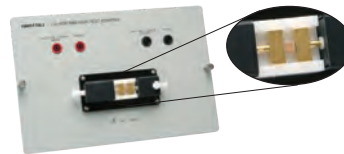
Heat resistance  
TO socket  
200°C, 350A (500 $\mu$ s)



Test Fixture for  
TSSOP 14



SMD type adaptor  
CS-508  
Adaptor for SMD type



Bottom view  
Banana plug



CS-501A  
TO



CS-502  
AXIAL



CS-503  
TO-263-3/ D2PAK



CS-504  
TO-252-3



CS-505  
TO-263-7



CS-506  
TO-252-5



CS-507  
SC-70-3/ SOT-323-3



CS-509  
SC-59A/ SOT-23-3L



CS-510  
SC-62/ SOT-89



CS-512  
TO-247-4L



CS-513  
DFN-8(5 $\times$ 6)





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Note: This datasheet includes some pre-release items. Some specifications are subject to change.