IWATSU

Semiconductor Curve tracer

CS-10000 Series
10kV～15kV ～8,000A

CS-5000 Series
5kV ～1,500A

CS-3000 Series
3kV ～1,000A

Multipurpose even fits leakage current, and high current. Auto measurement Supported!

The best solution to property measurement of semiconductors such as IGBTs, MOSFETs, TRANSISTORs and DIODEs from small to large capacities.

Advanced functions for your ease of use

■ **The setting result is displayed in the setup display area under CONFIGURATION key sets.**
A proper connection is selected for device measurements.

■ **The applied voltage and current are monitored in signal waveforms on WAVE mode.**
・Actual pulse signal waveforms applied on a device at the measurement point can be monitored on the time axis as with oscilloscope (WAVE) mode without extra probing.
・By confirming the waveform, appropriate pulse width and measurement timing can be decided.
・This function also helps confirming the abnormality caused by heat such as a oscillation, etc.
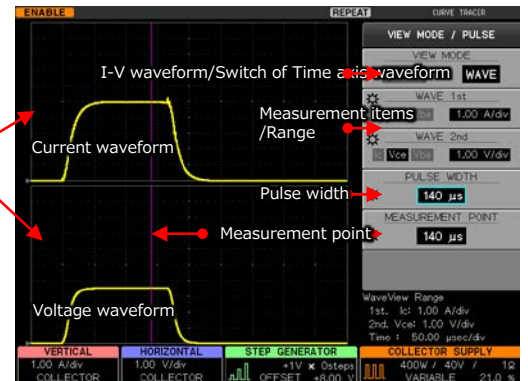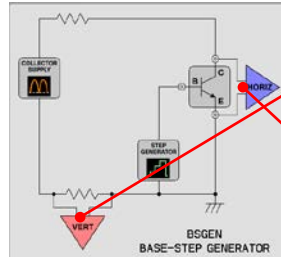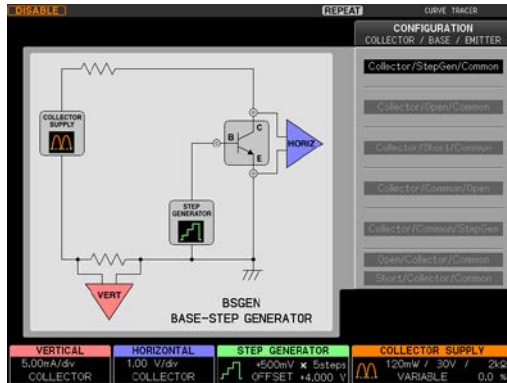
Full automation by high affinity with PC

■ **Semiconductor parameter measurement software CS-810 (optional)**
This is a software performing auto measurement through remote controlling with curve tracer main unit.
This software can execute stress test; which was hard to do using traditional curve tracers, and can measure temperature characteristics of devices, while controlling a hotplate or a thermostatic chamber.

■ **USB memory:**
Graphic Images: Data, and Setup conditions
Formats: TIFF,BMP,PNG. (Black or White color of background, color or monochrome)
Waveform data: Text (CSV) and in Binary

■ **Remote Control tool** (free download)
In case that security policy restricts use of USB, the remote control tool for PC is provided.
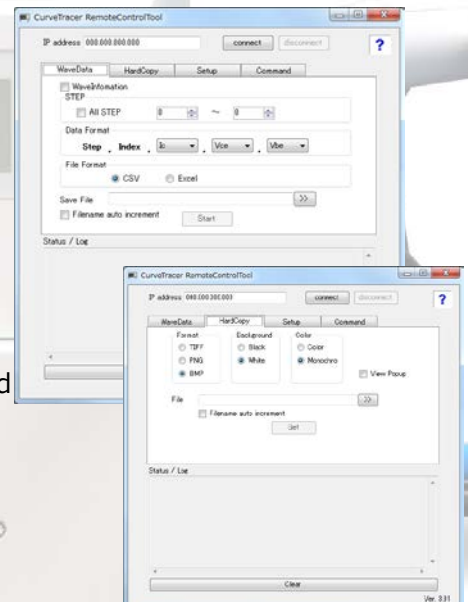
■ **Ethernet:**
Provided as a standard function (on the back side of Main unit)

Automatic measurement connecting with PC, Scanner, Thermostatic chamber, etc. are available.
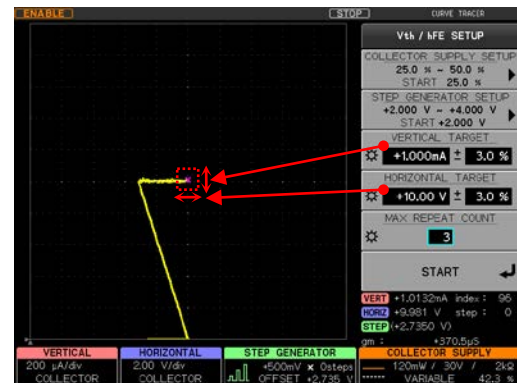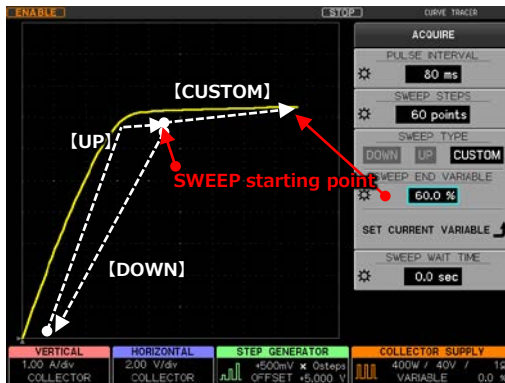
■Sweep

Number of points to, sweeping speed, resolution, and the DOWN/UP sweep can be set at your needs.
As the CUSTOM sweep performs sweeping in high speed and high resolution measurement.

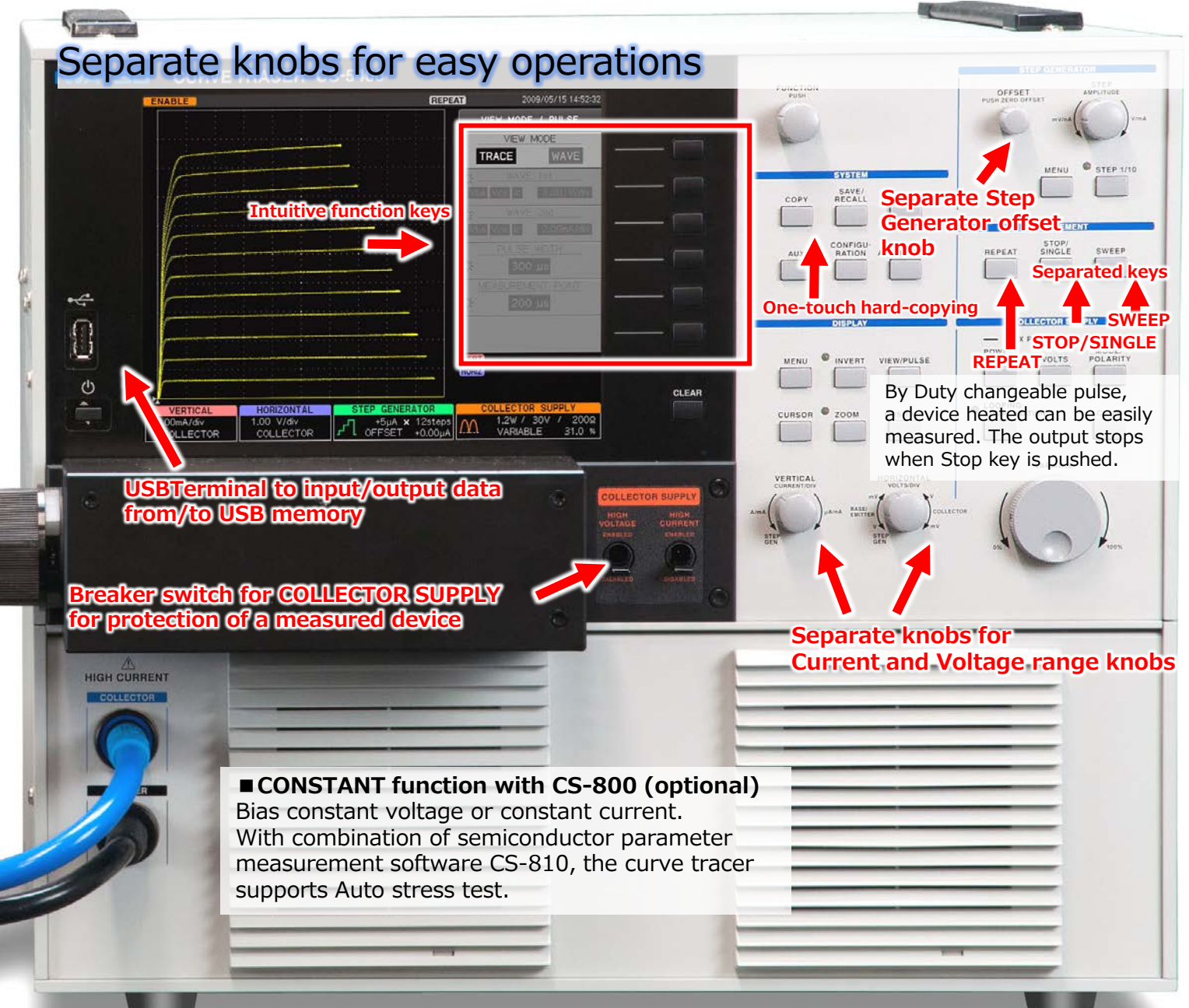## ■Limit-SWEEP function (CS-800 option)

This function puts limits on current and voltage through usual sweep measurement for device protection purpose and stopping the sweep at the target.

■Vth-hFE auto search function (CS-800 option)

This function automatically finds the Vth-hFE with the setting of conditions. There will be no need for complicated operations anymore.

Separate knobs for easy operations

Intuitive function keys

Separate Step Generator offset knob

One-touch hard-copying

Separated keys

SWEEP

STOP/SINGLE

REPEAT

By Duty changeable pulse, a device heated can be easily measured. The output stops when Stop key is pushed.

USBTerminal to input/output data from/to USB memory

Breaker switch for COLLECTOR SUPPLY for protection of a measured device

Separate knobs for Current and Voltage range knobs

■CONSTANT function with CS-800 (optional)

Bias constant voltage or constant current.
With combination of semiconductor parameter measurement software CS-810, the curve tracer supports Auto stress test.

CS-5000 Series   5kV

Best suited for measuring the breakdown of a power
device having 3,300V withstand voltage

- Max. Peak Voltage: 5,000V (High-Voltage mode)
- Max. Peak Current: 1,500A (CS-5400 High-Current mode)
- All models support the LEAKAGE mode (Cursor resolution:1pA)
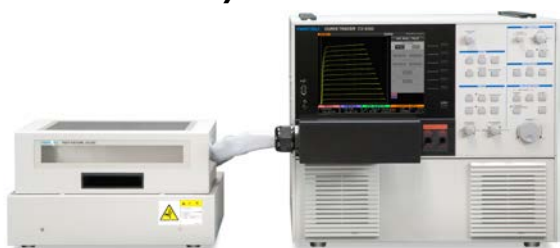
CS-5400

5kV
CS-5400 1,500A (HC mode pulse)

CS-5200/5300

5kV
CS-5300 1,000A (HC mode pulse)
CS-5200   400A (HC mode pulse)

CS-5100

5kV
CS-5100 (HC mode not equipped)

Collector supply HV mode

Model	CS-5000 series	
Mode/Polarity	Rectified SINE +/-, DC +/-, LEAKAGE +/-, AC	
Max. Peak Voltage/Current	Max. Peak Voltage	Max. Peak Current (Max. Peak Pulse Current)
	5kV	25mA (25mA)
	300V	750mA (1.5A)
	30V	7.5A (15A)
Max. Peak Power	At 5kV : 320mW/3.2W/32W At 30V,300V : 120mW/1.2W/120W/390W	
Horizontal axis range	50mV～500V/div	

Collector supply HC mode (CS-5100 does not equip with HC mode)

Model	CS-5100	CS-5200		CS-5300		CS-5400	
HC mode							
Mode/Polarity		Pulse +/-					
Max. Peak Current Max. Peak Power Max. Peak Voltage	No HC Mode equipped	Max. Peak Current/ Power	Max. Peak Voltage	Max. Peak Current/Power	Max. Peak Voltage	Max. Peak Current/Power	Max. Peak Voltage
		400A / 4kW	40V	1,000A / 10kW	40V	1,500A / 12kW	30V
		40A / 400W	40V	400A / 4kW	40V	600A / 4.5kW	30V
				40A / 400W	40V	60A / 450W	30V
Pulse width		Pulse width : variable between 50µs and 400µs (Resolution :10µs)					
Measurement point		Measurement point can be specified. (Resolution :10µs)					
Vertical range		100mA～50A/div		100mA～100A/div		100mA～200A/div	
Fixture	CS-303					CS-304	

CS-3000 Series   3kV

Standard models suitable for property measurement of various semiconductor such as IGBTs, MOSFETs, transistors and diode, etc.

- ● Max. Peak Voltage 3,000V (High-Voltage mode)
- ● Max. Peak Current 1,000A (CS-3300 High-Current mode)
- ● All models support the LEAKAGE mode (Cursor resolution:1pA)

CS-3200/3300

3kV
CS-3300 1,000A (HC mode pulse)
CS-3200   400A (HC mode pulse)

CS-3100

3kV
CS-3100 (HC mode not equipped)

Collector Supply HV mode

Mode	All CS-3000 Series		
Mode/Polarity	Rectified SINE +/-, DC +/-, LEAKAGE +/-, AC		
Max. Peak Voltage/Current	Max. Peak Voltage	Max. Peak Current (Max. Peak Pulse Current)	
	3kV	75mA (150mA)	
	300V	750mA (1.5A)	
	30V	7.5A (15A)	
Max. Peak Power	120mW / 1.2W / 120W / 390W* (*Setup is not available when Max. Peak Voltage 3kV is used.)		
Horizontal axis Range	50mV～500V/div		

Collector Supply HC mode (CS-3100 does not equip with HC mode)

Model		CS-3100	CS-3200		CS-3300	
HC Mode						
	Mode/Polarity		Pulse +/-			
	Max. Peak Current Max. Peak Power Max. Peak Voltage	No HC mode equipped	Max. Peak Current/Power	Max. Peak Voltage	Max. Peak Current/Power	Max. Peak Voltage
			400A / 4kW	40V	1,000A / 10kW	40V
			40A / 400W	40V	400A / 4kW	40V
					40A / 400W	40V
	Pulse width		Pulse width: Changeable between 50μs to 400μs (Resolution: 10μs)			
	Measurement point		Measurement point can be specified. (Resolution: 10μs)			
	Vertical axis range		100mA～50A/div		100mA～100A/div	
Fixture		CS-301	CS-302			

Analog Curve Tracer   10kV～

Best suited for the measurement of high voltage diodes and thyristors

Output

Voltage waveform : Commercial Power supply half-wave rectification waveform

Max.Voltage : 10kV Peak (when no loading)

Max. Current : 100mA Peak or 400mA

Display

Voltage range : 50V/div～1,000V/div (1-2-5 steps)

Current range : 0.1mA/div～10mA/div or 50mA/div

Customers' special specifications are welcome. Please contact us.

CS-10000 Series 10kV, 12kV and 15kV

Best suited for the chips with very high voltage and
very high current, CS-3100 + UHV + HC

CS-15800 15kV 8,000A
CS-12800 12kV 8,000A
CS-10800 10kV 8,000A
CS-10400 10kV 4,000A

This series are sold-on-demand.
Please confirm the specification and
the delivery date at the time of estimation.
Requests for tailoring are welcome.

Optional Pulse Unit
This is an optional unit prevents the characteristic
change and the breakdown from getting heat. We can
configure the rising time of the pulse from 1/3/5ms,
pulse width within the range of 1ms to 20ms, interval
time within the range of 100ms to 2s. (This unit will be
attached inside the curve tracer, so please order this
unit when you order the curve tracer, or we will ask
you to send your tracer to our factory.)
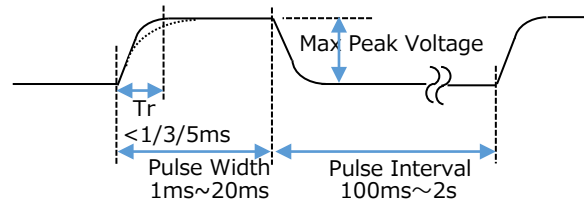
Collector Supply HV mode

Model	CS-10000 Series	
Model/Polarity	Rectified SINE +/-, DC +/-, LEAKAGE +/-, AC	
Max. Peak Voltage/Current	Max. Peak Voltage	Max. Peak Current (Max. Peak Pulse Current)
	3kV	75mA (150mA)
	300V	750mA (1.5A)
	30V	7.5A (15A)
Max. Peak Power	120mW / 1.2W / 120W / 390W* (*Setup is not available when Max. Peak Voltage 3kV is used.)	

Collector Supply UHV mode

Model	CS-10400/CS-10800		CS-12800		CS-15800	
Mode/Polarity	DC +					
Max. Peak Voltage/Current	Max. Peak Voltage	Max. Peak Current	Max. Peak Voltage	Max. Peak Current	Max. Peak Voltage	Max. Peak Current
	10kV	400mA	12kV	266mA	15kV	266mA
Max. Peak Power	40W / 400W / 4kW		32W / 320W / 3.2kW		40W /400W / 4kW	

Collector Supply HC mode

Model	CS-10400		CS-10800/12800/15800	
Mode/Polarity	Pulse +/-			
Max. Peak Current / Max. Peak Power / Max. Peak Voltage	Max. Peak Current / Power	Max. Peak Voltage	Max. Peak Current / Power	Max. Peak Voltage
	4,000A / 60kW	60V	8,000A / 80kW	40V
	400A / 6kW	60V	4,000A / 60kW	60V
	40A / 600W	60V	400A / 6kW	60V
			40A / 600W	60V
Pulse width	50μs~900μs , 50μs~120μs (at 8,000A) (Resolution:10μs)			
Measurement point	Measurement point can be specified. (Resolution :10μs)			
Horizontal axis range	100mA~1,000A/div			

Test adaptors

■ Test adaptors for discrete packages

CS-500 (Standard)
Test adaptor:
Used to connect your tool
to Fixture.

**Heat resistant
TO Socket**
200℃、350A (500μs)

**Fixture for
TSSOP 14**
※Fixture
Not for CS-301

CS-508
Adaptor for SMD type
※Fixture
Not for CS-301

Example:
Fixture attached

Connector pins on
the bottom of Socket

CS-501A
TO-220/247

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-23-3

CS-510
SC-62/
SOT-89

Contact us if other types of sockets are needed.

Standard accessories

Use test adaptors on measurements of devices.   Fixtures equips the safety mechanism in which the measurement stops when the cover opens.

Fixture S

Fixture S
CS-301
(comes with CS-3100)

Fixture M
This fixture can measure a device up to 235mm×180mm. Place the
patch panel attached when TO adaptor used.

Fixture M
CS-302
(comes with CS-3200/3300)
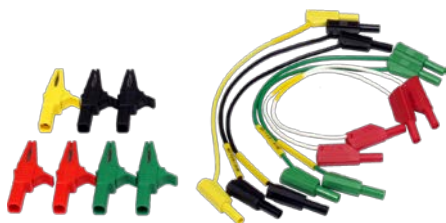**CS-303**
(come with CS-5100/5200/5300)

Fixture M
CS-304
(comes with CS-5400)

(Note: Test adaptor is optional and
does not come with the unit.)

Patch-panel for Fixture M
(comes with all units except
for CS-3100)

Standard set of leads
CS-005
(come with all units except for CS-3100)
Banana cables (2 red for HV, 2 green, 2 black, 1 yellow)
Alligator clip (2 Red , 2 green, 2 black, 1 yellow)

Cable for High Current (a set of two)
CS-006
(comes with CS-5400) 20cm
CS-007
(come with CS-10400/10800/12800/15800) 30cm

Contact us for custom-made cables. We can change clips, lengths,
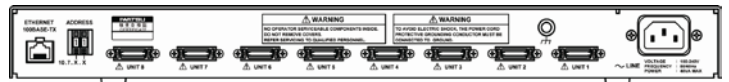withstand voltages, etc.

Scanner System : CS-700

A software application, CS-810, will automate reconnection of terminals of 6 in 1, 2 in 1 or multiple devices clips.
CS -810 even controls relay units, thermostatic chambers and hot plates, so it can measure the temperature characteristics of each chips in 6 in 1 modules.
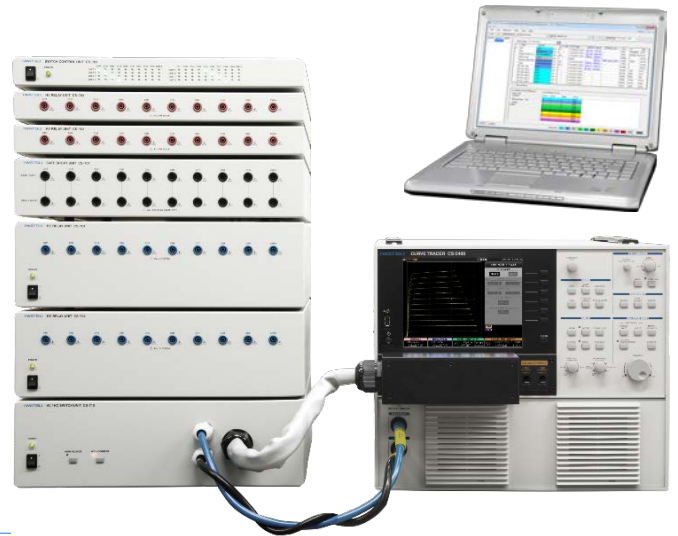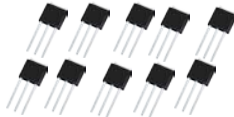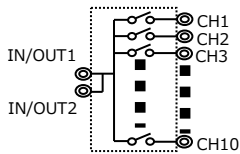
Switch Controlling Unit

CS-701

Rear of SC-701

SC-701 is a must unit in order that the software CS810 can controls each CS-700 scanner unit up to 8 units, by connecting a PC through Ethernet. Multiple CS-701 (Max.10 units) can operate in parallel if given IP addresses.

Relay Unit

LV Relay Unit
CS-702
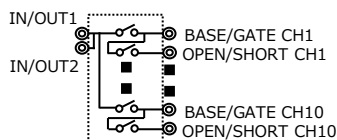300V/7.5A/30A (Pulse)
10CH

HV Relay Unit
CS-703
5kV/0.5A
10CH

HC Relay Unit
CS-704
2kV/7.5A/1,000A (Pulse)
10CH

When 6 in 1 module is measured, this unit can short-circuit G and E, or C and G on unused circuits on the device.

Gate/Short Unit
CS-707
Curve racer side:
300V/7.5A/15A (Pulse)
Device side:
5kV/7.5A/15A (Pulse)
10CH

HV-HC Relay Unit
CS-708
5kV/7.5A/1,500A (Pulse)
2CH

HV-HC Relay Unit
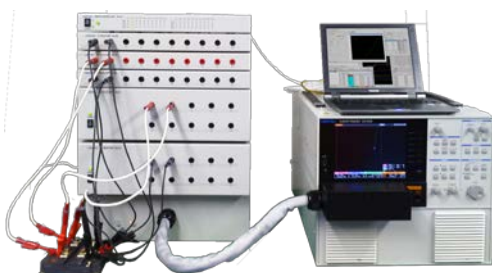**CS-709**
5kV/7.5A/1,500A (Pulse)
4CH

Extension Unit

Extension Unit
CS-706
5kV/1,000A (Pulse)
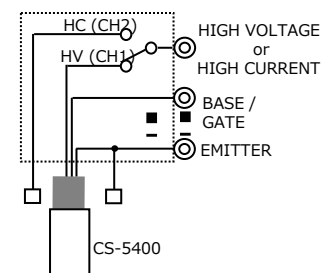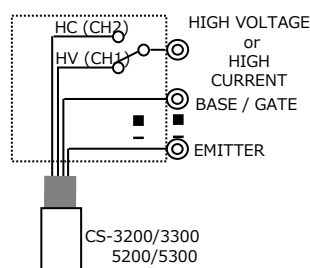In case CS-5400 is used, modifications are required.

HV/HC Switch Unit
CS-705
5kV/1,000A (Pulse)
HV/HC switching (Auto/Manual) supported
・For CS-3200/3300/5200/5300

HV/HC Switch Unit
CS-710
5kV/1,500A (Pulse)
HV/HC switching (Auto/Manual) supported
・For CS-5400

HC (CH2)
HV (CH1)
HIGH VOLTAGE or HIGH CURRENT
BASE / GATE
EMITTER
CS-3200/3300 5200/5300

HC (CH2)
HV (CH1)
HIGH VOLTAGE or HIGH CURRENT
BASE / GATE
EMITTER
CS-5400

Example: connecting the unit to IGBT 2 in 1 module.

Hotplates, Fixtures, thermostatic chambers that support establishment of Automatic temperature measurement system

Temperature characteristics measurement
CS-810 automatically measures temperature characteristics, controlling the scanner system and hotplates, etc.

The picture on the right is a hotplate controllable combination of curve tracers, hotplates, and scanners. It will let us perform automatic measurement of multiple devices, 6 in 1 module, etc.

V_{th}
V_{CEsat}

Gate Threshold

Resistance when this unit is on.
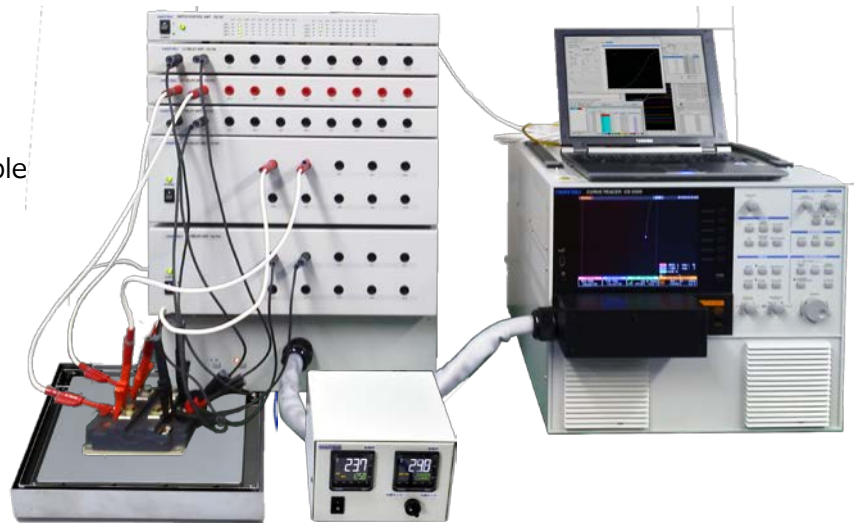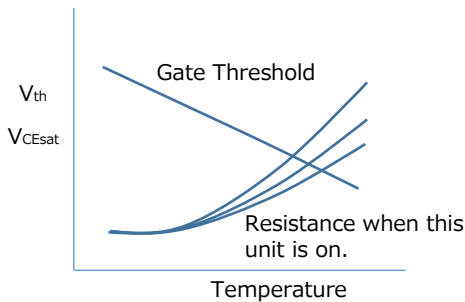
Temperature

Fixture with hotplate functions CTJ1050
Maker : CATS Inc.
Max. Temperature : 200℃
Max Voltage on devices 5kV
(Insulating surface of heater 5kV)
Max. Current : 1,000A
Interlocking (when you open the cover, curve tracer stops outputting.)

**Hot-Plate
PA3020/PA3040**
Maker : MSA Factory Co., Ltd.
Max. Temperature : 300℃
Hot plate measurement :
PA3020 : 200×200
PA3040 : 200×400
Monitor Temperature by External temperature sensor.

Thermostatic chambers are available.
Contact us for the details.

For CS-5400

For CS-3xxx/5xxx
(Except CS-5400)

Prober cable:
This is used to equip terminals of curve tracers inside Probers and large fixture.

CS-305
Cooling fan, LED light, Warning light, Power supply outlet and Interlock are equipped.
External dimensions: 630Wx520Hx530D

Internal terminals portion

Large Fixture
CS-307
Interlock equipped
External dimensions: 500Wx520Hx520D

Software Application for parameter measurement of semiconductors : CS-810

CS-810 is an optional Software application that controls curve tracers, scanners, hotplates performing measurement and thereby automates the measurement. This makes improvement great in work efficiency.

Automates:
Measurement→Recording→Judgment
Improvements in efficiency to replace task that was traditionally performed manually

	Ices	Vces	VF	Vth	··
Sample-1	*****A	****V	****V	****V	··
Sample-2	*****A	****V	****V	****V	··
Sample-3	*****A	****V	****V	****V	··
:	:	:	:	:	:

Switches automatically multiple-semiconductor modules and discrete devices to be targeted when you perform measurement

Hotplates are also remote-controllable, so Automatic measurement of 6 in 1 module can be performed too.
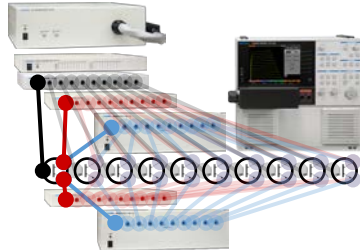
Easy to transfer the configuration measured to PC

By transferring the configuration measured manually on curve tracer to PC, you can set up the sequence.
The programming knowledge is not required and anyone can set up it easily.

This key copies the configurations in the curve tracer to PC.

This key copies the configurations in PC to the Curve trace.

Categorization to the levels based on the measured value.
You can set 10 levels to which acquired result will be categorized.
For each levels, events to be performed, such as halting the measurement, skipping the measurement of such item Showing an alert, Copying the waveform as an image, exporting to CSV files.
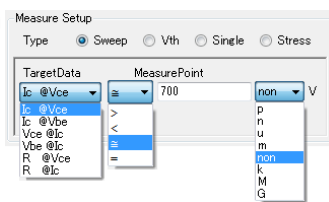
This window is useful when you specify the threshold for the levels.
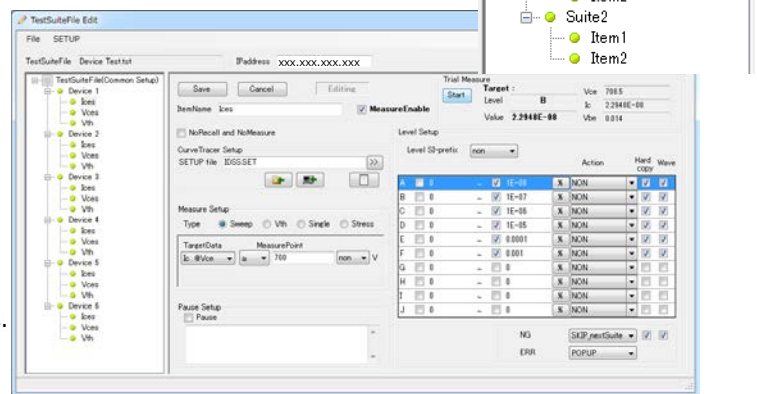
Measurement of static characteristics (Leakage current, Saturation voltage, VF, Vth, etc.)
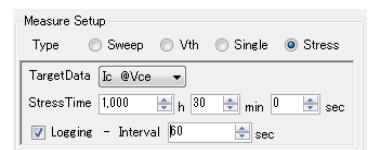
Measurement type : Sweep

> Point with the larger data than the specified value.
< Point with the smaller data than the specified value.
≧ Point with the data closer to the specified value.
= Point with data equal to the specified value under interpolation.

Trial Measurement:
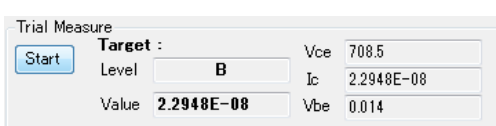This is a function for debugging and the sequence can be confirmed.

Measurement type : Stress

Logging of voltage or current is available by biasing constant voltage or constant current for a long time. This is used for Stress test and reliability test.

Measurement type : Vth
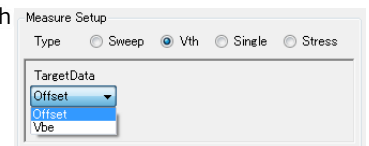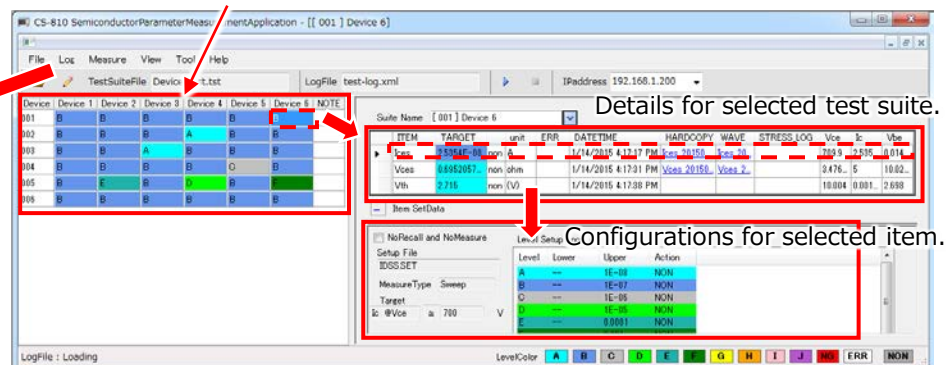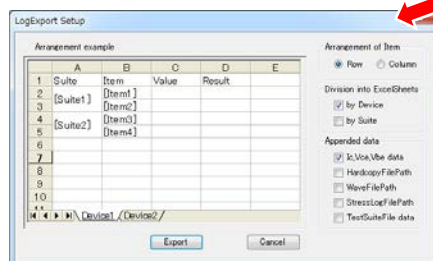
Makes measurement with the curve tracer's Vth Search function.

Output Window

Shows the worst data for Item in each test

A selection of export formats
For the log file.

Details for selected test suite.

Configurations for selected item.

Software Application for parameter measurement of semiconductors : CS-810

Comparison 10 traces and currently measured curve

**Comparison** between the waveforms and Judgment functions with reference curve

Waveforms save/recall from PC data up to 10 waveforms which stored at CSV file basis.

Rescaling storing CSV data at an arbitrary interval in voltage axis.

Cursor function displaying values at cursor position shown in a list. Between the two sampling points, this function interpolates the measured data.

Annotations can be attached to the curves respectively.

Saving the images choosing image format (PNG/BMP/JPG/TIFF) with a set of cursor values.
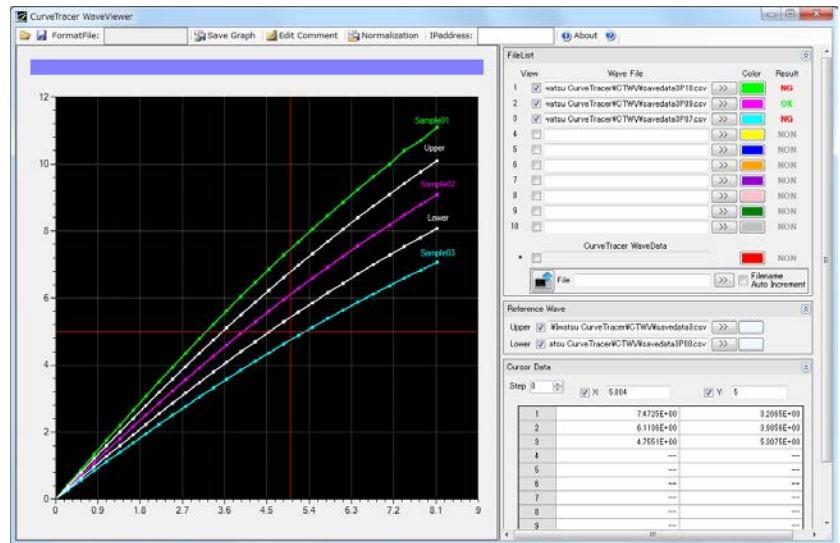
A selection of Graph styles
- Settable items -
Chart title, background color, cursor color, line style (solid, dotted, broken)
For X and Y axes: Title, what data to be assigned, Scale (Log, linear) For Y axis only, intervals, min value, max value and grids.

The measuring function for the transfer characteristics (Vge-Ic/Vge-Vce)

It was difficult for a curve tracer to measure the transfer characteristics, however we can measure it now.

Various formats to save curves for characteristics
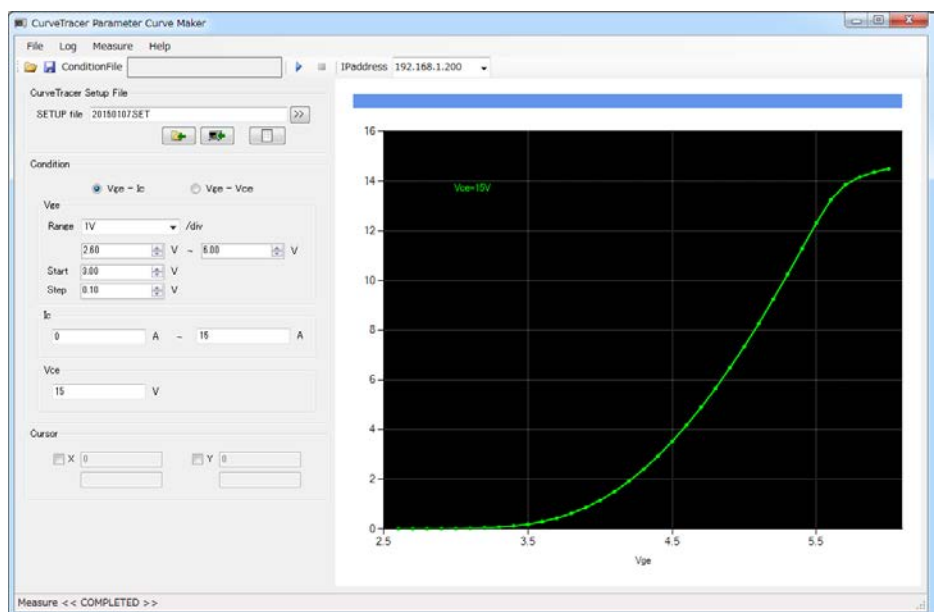(CSV and image as PNG/BMP/JPG/TIFF)

Cursor function displaying in X axis and Y axis interpolated values

Customizable chart area
Chart title, axis label, background-color, and the axis ranges are all customizable.

Load/Save function of Configurations
for characteristics measurement and the customize done to the chart area.

Software Application for parameter measurement of semiconductors : CS-810

■ Measurement of devices

**Multiple devices measurement and recordings can be performed in a short time.**

Operators just need to input sample name according to the device replacements and connection changes to repeat the same measurements. Judgments (Pass/Fail) at conditions given will be shown for each measurement, and images and waveforms data also will be stored automatically.

1. Input sample name and set it to Fixture.

2. Displays the measured value and the judgment results during measurement.
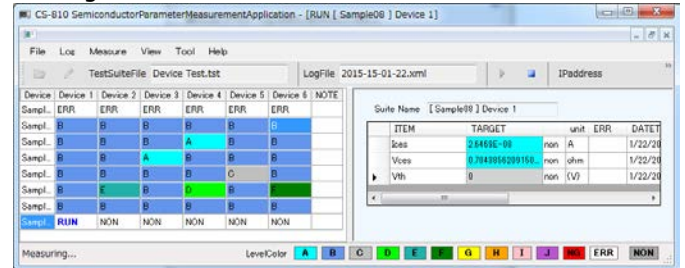
3. Popup stops the measurement or gives instructions based on the measurement results.

4. Popup stops the measurement or gives Instructions based on measured items.

5. Logs on the measurement can be exported to CSV file or Excel file afterwards. Logs on Stress test will be saved on separate files. Re-measurement of the selected item can be performed.
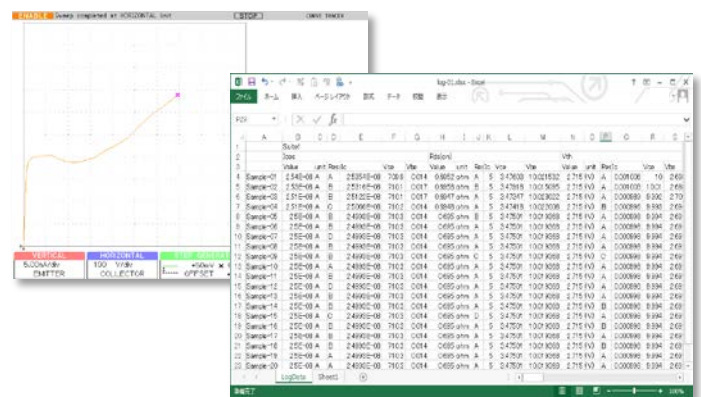
Measurement function of circuit modules

This software controls scanner system as well as The curve tracer. As it even controls open/short and HV/VC, all the measurement for a module can be fully automatically performed without a need for unplugging.

Configuration on one-circuit can be applied to the other circuit as the application supports copy & paste.

Unused Gates and Emitters can be short-circuited.

■Evaluation of Semiconductor Temperature characteristics measurement

CS-810 controls hotplates too. Even measurement that takes a long time such as per temperature can also be performed automatically.
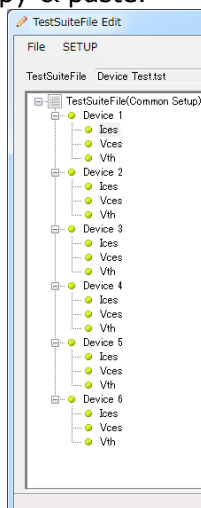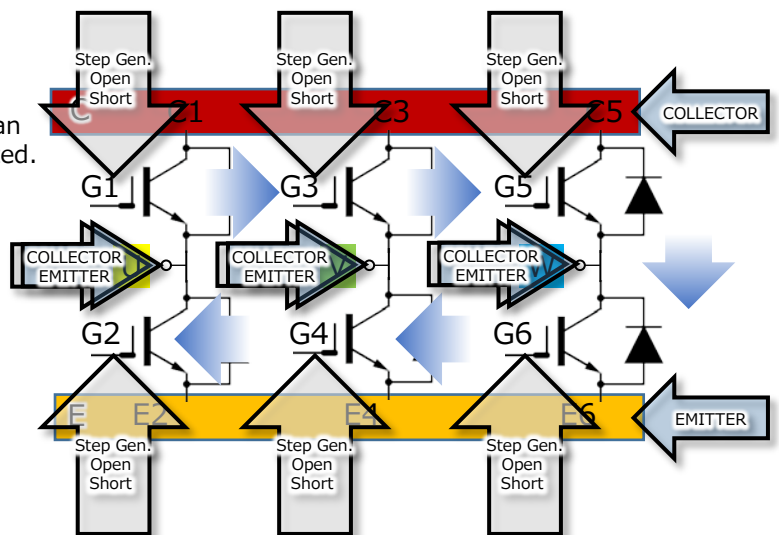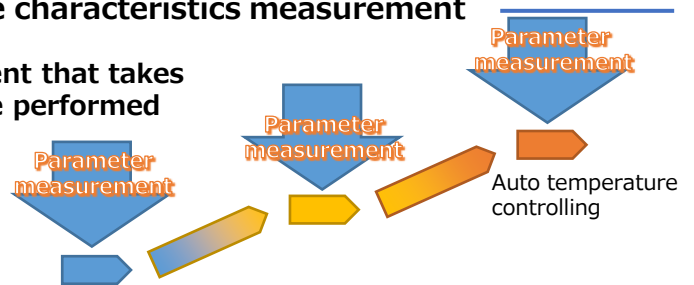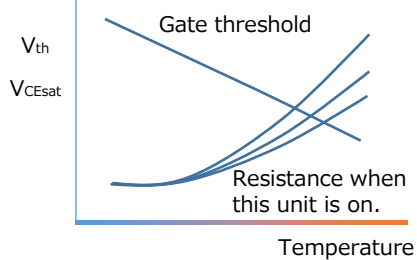
V_{th}
V_{CEsat}

Gate threshold

Resistance when this unit is on.

Temperature

Parameter measurement

Parameter measurement

Parameter measurement

Auto temperature controlling

Currently, we just offer fixtures with hotplates, but we are trying our best to offer a unit simply provides hotplates or fixed-temperature chamber. For details on supported units, feel free to ask us.

■Stress test

A wide variety of parameters can be incorporated in stress test.

This software supports long-time reliability tests. While the software watches the voltage and the current via curve tracers, diffs of those are logged.
Auto measurement of parameters is available in the track or around of the stress test. The biasing will stop in excess of the limit value which is set for current or voltage as a lower and a upper limits.

The software measures Ic or Vce (Interval: 10s to 2h) keeping a certain voltage or current (10s to 1,000h)

Parameter measurement

Logging changes in voltage or current at regular time intervals applying certain current or voltage.

Parameter measurement

Logging changes in voltage or current at regular time intervals applying certain current or voltage.

Parameter measurement

V_{CE}

Time

Vth

V_{CES}

V_F

I_{CE}
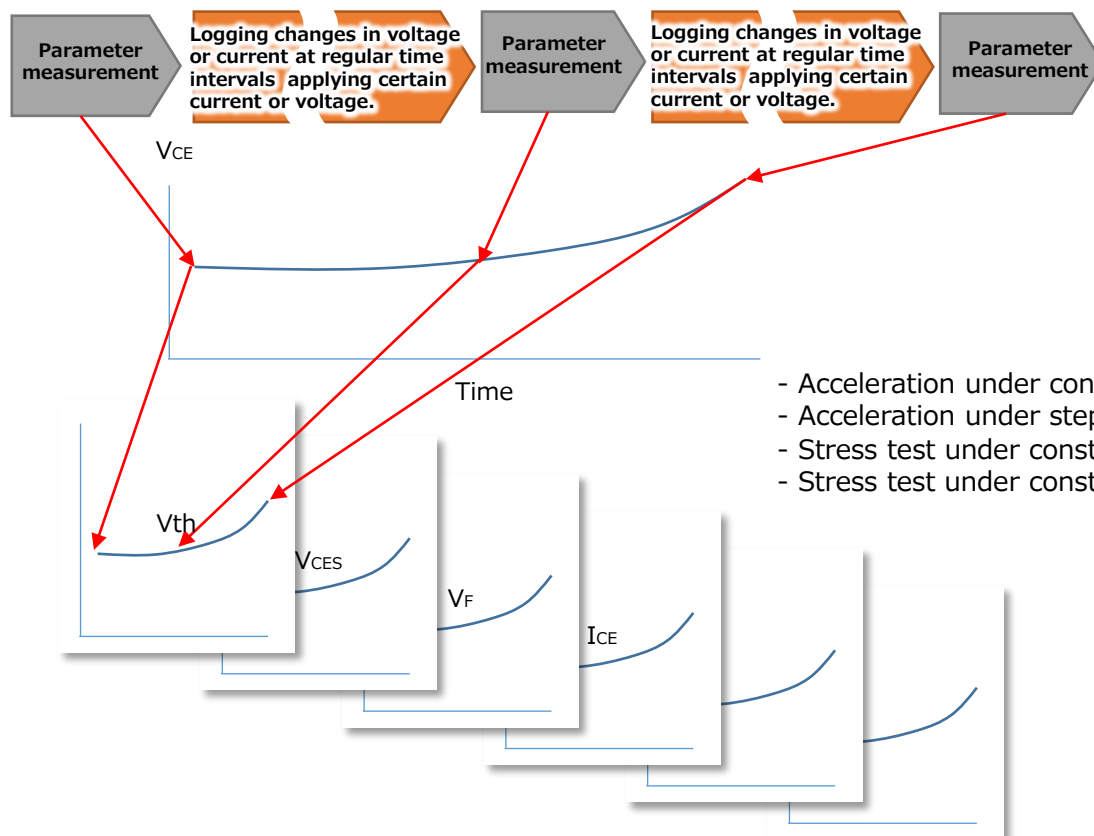
- Acceleration under constant stress
- Acceleration under step-stress
- Stress test under constant DC current
- Stress test under constant low voltage

Software Application for parameter measurement of semiconductors : CS-810

■ Test of Discrete devices

Measurement of multiple devices with one touch operation after cable connection

CS-810 will let us copy the configuration for one circuits to the others up to 10CH*, making it easier to iterate the circuits and perform measurement for each Circuit.
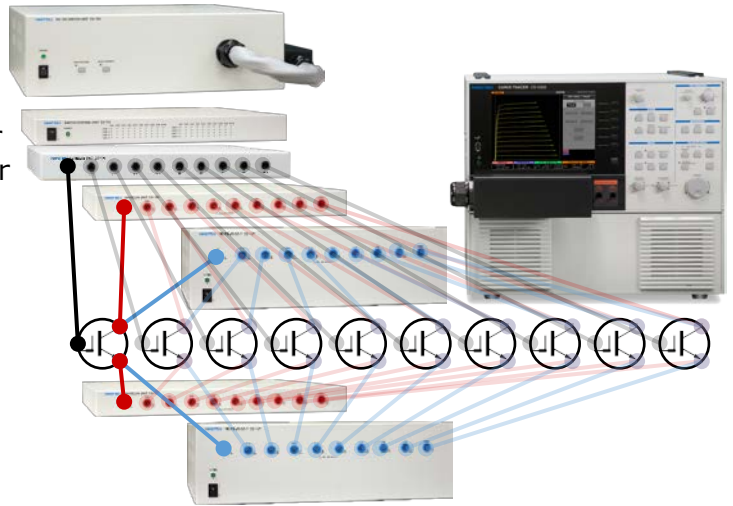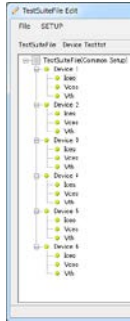
*Up to 10 systems operate in parallel on CS-700 Series.

Measurement of wafers

Devices on wafers can be measured by connecting a prober system.
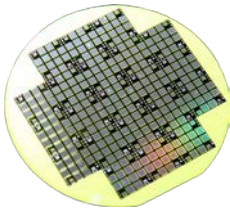
Contact us for the customized semiconductor parameter measurement software.

We have cables for connections to probers. Some terminal has interlocking feature. So you can use it safely.

Prober cable

Prober side

Curve tracer side

Mount face

850±30

80

Top face

230

10-4.5φ

80   80   80

Maintenance Label

120
110

100

47

230

250

Output range for each model

HV mode Max. Peak Voltage/Max. Peak Current (Pulse current)

Mode \ Model	CS-3300 CS-3200 CS-3100	CS-5400 CS-5300 CS-5200 CS-5100	CS-10800 CS-10400	CS-12800	CS-15800
+DC	-	-	10kV/400mA	12kV/266mA	15kV/266mA
LEAKAGE/DC Rectified SINE/AC	3kV/75mA (150mA)	5kV/25mA (25mA)	3kV/75mA (150mA)		
	300V/750mA (1.5A)				
	30V/7.5A (15A)				

HC mode Max. Peak Current/Max. Peak Power/Max. Peak Voltage

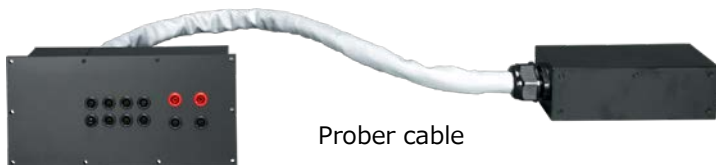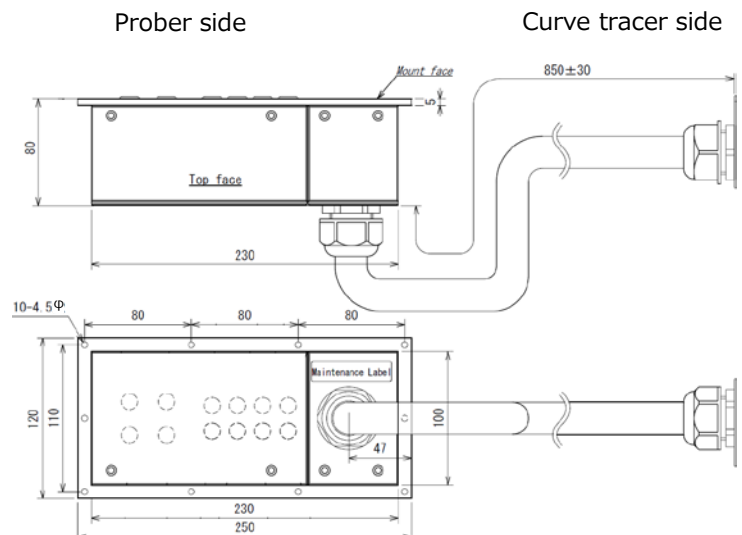| Mode \ Model	CS-5100 CS-3100	CS-5200 CS-3200	CS-5300 CS-3300	CS-5400	CS-10400	CS-10800 CS-12800 CS-15800
±Pulse	- (HC mode not equipped)	-	1,000A/10kW/40V	1,500A/12kW/30V	-	8,000A/80kW/40V
					4,000A/60kW/60V	
		400A/4kW/40V		600A/4.5kW/30V	400A/6kW/60V	
		40A/400W/40V		60A/450W/30V	40A/600W/60V	

Common Specifications

Loop Correction	Hardware		Correction of floating capacitance between collector supply and ground
	Software		Simulated loop procedure by software thinning process
Step Generator	Offset	Setup range Resolution	-10 times ～+10 times of SETTING UP of STEP AMPLITUDE 1% of SETTING UP of STEP AMPLITUDE
	Current mode	Amplitude range Max. Current Max. Voltage	21 steps /50nA～200mA, 1-2-5 switchable 2A More than 10V
	Voltage mode	Amplitude range Max. Current Max. Voltage	6 steps/50mV～2V, 1-2-5 switchable ±40V 500mA～ (～8V), 200mA～ (～15V), 10mA～ (～40V)
	Step rate		Twice of 50Hz or 60Hz (the same rate when AC mode), Pulse interval when HC mode
	Pulse step	Pulse width	50μs～400μs (10μs step) When HC mode set, approx.100μs wider-pulse width against collector supply pulse
	Number of steps		0～20 steps
AUX Output		Range	OFF, −40V～40V (Switchable at 100mV step)
Measurement Mode			REPEAT, STOP/SINGLE, SWEEP
Vertical axis (Full scale:10div)	Collector current	Range	HV Mode : 1μA/div～2A/div, 20steps 1-2-5 switchable (HC mode written separately)
		Accuracy	Add 2% of Readout+0.05×VERT/div to the loop correction error of the following max. peak voltage 0.5μA (30V), 1μA (300V), 6μA (3kV), 12μA (5kV) 30V,300V,3kV More than 10% of Max. Peak voltage, More than 30% (5kV)
	Emitter current (LEAKAGE)	Range	1nA/div～2mA/div, 20steps 1-2-5 switchable (Collector Supply mode: LEAKAGE)
		Accuracy	2% of Readout + 0.05×VERT/div + less than 1nA
Horizontal axis (Full scale:10div)	Collector voltage	Range	HC mode : 50mV/div～5V/div, 7 steps 1-2-5 switchable (HV mode written separately)
		Accuracy	2% of Readout less than +0.05×HORIZ/div
	Base/Emitter voltage	Range	50mV/div～5V/div, 7 steps 1-2-5 switchable
		Accuracy	2% of Readout less than +0.05×HORIZ/div
Screen	Display		8.4 inch TFT LCD
	Number of Data		1,000 points/trace (AC, Full-wave rectification) 20～1,000 points/trace (SWEEP mode)
	Trace display		Interpolation display between points, Dot display
	Average		OFF, 2～255 times
	Persistence		OFF, SHORT, LONG, unlimited length
	Internal waveform storage (REF)		4 screens
Cursor measurement	DOT		Vert, Horiz, β or gm
	fLINE		Vert, Horiz, 1/grad, intercept
	FREE		Vert, Horiz, β or gm
	WINDOW		Vert in WINDOW area, Horiz, β or gm
Data recording/Readout	Internal memory		Setup:256, REF : 4 screens
	External memory		USB1.1 : Setup, Waveform, Screen hardcopy (BMP,TIFF, PNG)
Remote			Remote on LAN 10BASE-T/100BASE-TX 1 port
Power supply	CS-3xxx,5xxx		AC100V-AC240V 50/60Hz, Max Power:500VA (operation), 7W Max (waiting)
	CS-1xxxx		AC200V single phase 50/60Hz, Max Power:10kVA (operation)
External dimensions (mm) (excluding projection portion and accessories) Weight (excluding accessories)	CS-3100,5100		424W x 220H x 555D, approx.28kg
	CS-3200,3300,5200,5300,5400		424W x 354H x 555D, approx.43kg
	CS-10400,10800,12800,15800		1,110W x 1,216H x 1,150D, approx.370kg

Order Information

	Model Name	Model Number	Remarks
Main unit	Semi-conductor Curve tracer	CS-3100	3kV
		CS-3200	3kV, 400A
		CS-3300	3kV, 1,000A
		CS-5100	5kV
		CS-5200	5kV, 400A
		CS-5300	5kV, 1,000A
		CS-5400	5kV, 1,500A
		CS-10400	10kV, 4,000A
		CS-10800	10kV, 8,000A
		CS-12800	12kV, 8,000A
		CS-15800	15kV, 8,000A
Fixture	Fixture S	CS-301	Come with CS-3100
	Fixture M	CS-302	Come with CS-3200/3300
		CS-303	Come with CS-5100/5200/5300
		CS-304	Come with CS-5400
	Large Fixture	CS-307	
		CS-308	
Prober Cable	Fixture cable for CS-5400		Custom-made (Contact us)
	Prober cable		Custom-made (Contact us)
Alligator Clip	Small alligator clip Red 10pcs	CS-001	
	Small alligator clip Black 10pcs	CS-002	
Cable	High voltage wire Red 5pcs	CS-003	Banana clip, 5kV, 30cm
	Wire Black 5pcs	CS-004	Banana clip, 30cm
	Standard Lead Set	CS-005	Come with Main unit except CS-3100, Banana cable 30cm (Red 2pcs for HV, Black 2pcs, Green 2pcs, and Yellow 1pc. Alligator Clip (Red 2pcs, Green 2pcs, Black 2pcs, and Yellow 1pc)
	Cable for High Current	CS-006	20cm,2pcs come with CS-5400
	Cable for High Current	CS-007	30cm,2pcs come with CS-10400/10800
Software	Semi-conductor parameter search	CS-800	Built in Main unit
	Semi-conductor parameter measurement	CS-810	Install in PC
Test Adapter	Test adaptor	CS-500	Come with Main unit
	TO type test adaptor	CS-501A	
	AXIAL type adaptor	CS-502	
	TO-263-3(D2PAK) type adaptor	CS-503	
	TO-252-3 type adaptor	CS-504	
	TO-263-7 type adaptor	CS-505	
	TO-252-5 type adaptor	CS-506	
	SC-70-3(SOT-323-3) type adaptor	CS-507	
	SC-59A/SOT-23-3 type adaptor	CS-509	
	SC-62/SOT-89 type adaptor	CS-510	
Scanner unit	Switch control unit	CS-701	Integrated controller for each unit
	LV Relay unit	CS-702	300V/30A 10CH
	HV Relay unit	CS-703	5kV/3A 10CH
	HC Relay unit	CS-704	2kV/1,000A 10CH
	HV-HC Switch unit	CS-705	5kV/1,000A, Extension unit with HV/HC switch function
	Extension unit	CS-706	5kV/15A
	Gate/Short unit	CS-707	Curve tracer side:300V/8A Device side:5kV/8A 10CH
	HV-HC Relay unit 2CH	CS-708	5kV/1,500A 2CH
	HV-HC Relay unit 4CH	CS-709	5kV/1,500A 4CH
	HV-HC Switch unit (for CS-5400)	CS-710	5kV/1,500A, Extension unit with HV/HC switch function

Model Name	Model Number	Remarks
Fixture with hotplate function	CTJ1050	Heater surface 5kV insulating, Max. Temperature:200℃, Interlock function
Hotplate	PA3020	Dimension of Plate portion:200×200mm
	PA3040	Dimension of Plate portion:200×400mm