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Product Lineup

- Contact type(4point probe, etc) : Sheet resistance/Resistivity measurement system & in-line module unit
- Non-contact type(Eddy-current, etc) : Sheet resistance/Resistivity measurement system & in-line module unit
- Contact & Non-contact type : Wafer sorting system, P/N checker & in-line module, Silicon life-time tester
- Non-contact type(Electrostatic capacitance) : Wafer flatness measurement system
- Contact type : Spreading resistance measurement system

Specifications subject to change without notice.

Ver.1511

The Pioneer for Sheet Resistance/ Resistivity Measurement

NAPSON CORPORATION

PRODUCT GUIDE

- Resistance measurement systems with Contact and Non-contact type
- Various types of Evaluation systems for Semiconductor
- Meets a special requirement for measurement from a customer

NAPSON CORPORATION
TOKYO, JAPAN

NAPSON CORPORATION

Napson is A global leading developer and manufacturer for Resistance measurement systems with Contact and Non-contact type.

Contact type
- 4point probe method
- 2point probe method

Non-Contact type
- Eddy current method
- Pulse excitation method
- Electrostatic bond method
- Corona discharge method

Try to use and measure your samples with Napson demonstration systems.

Trial measurement
Resistance measurement for your understanding and validation.

Comparing with another competitive tools
Napson offers high-quality and high-accuracy measurement to you.

Charge-free demonstration*
Charge-free measurement before your consideration of an order process.
(*Please contact about terms)

〈 Procedure for Demonstration-measurement 〉

Application → **Choose measurement method** → **Demonstration measurement** → **Make a proposal**

Application
-Please contact us via our website or distributor.
-Please provide your requirement and sample information for demonstration measurement.

Choose measurement method
-You can choose the measurement method by followings;
1. Report measurement; Send samples to us and report to you after measurement.
2. Carry-in measurement; Bring samples by yourself and do measurement at our factory.

Demonstration measurement
-Measurement along your request.

Make a proposal
-We offer a product and solutions that are based on the measurement results

Napson offers to you the best measurement solution.

We are the professional for resistance measurement technology.

We can provide the best product for your needs by various kinds of solutions; Measurement method [Contact and Non-contact], System type [Full-automatic, Semi-automatic and Manual], Installation configuration [Standalone and In-line].

Our technology makes a contribution to the future.

Napson resistance measurement technology is employed to make many of the manufactured products we see around us.

- Silicon wafer,
- Diffusion, epitaxial wafer
- Ion implantation

etc

- Conductive thin film
- Compound semiconductor

etc

- Metal stock
- Metallic film, plate

etc

- Plastics material, Wood building materials, polyester
- Adhesive material, Coating material

etc

- New materials / Functional materials (carbon nanotube, graphene)

etc

- Highly-functional liquid crystal film
- Conductive rubber

etc

Commitments from Napson

1 The highest-quality service

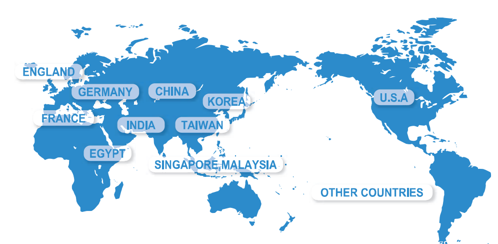
Napson supports users for every situations such as on-site measurement, after-sales-service and technical cooperation directly and/or through the exclusive distributors.
As a specialist in resistance measurement, Napson continue to courteous service to the user.

2 Advanced measurement technology

Napson supported by a brace of worldwide users who have trust in Napson technology.
As a leading company for resistance measurement, Napson makes a substantial contribution to the development of resistivity measurement technology.

3 Efficient worldwide distributing network

Napson constructs efficient worldwide distributing network by distributors from around the world(especially in Korea , Taiwan, China, Europe and USA).
To comply with user's request, Napson aims to speedy response.



Features of each measurement types

Measurement type	Contact type	Non-contact type
Advantage	● Wide measurement range ● Absolute value measurement ● Narrow measurement area	● No damage by contact ● No influence of contact resistance
Disadvantage	● Sample may be damaged by probe contact	● Calibration to a reference resistance sample is required ● Sample thickness is limited by probe gap [*Depends in case]

System Lineups

Napson can offer the resistance measurement system to users from 2 kinds of measurement method (contact and non-contact) and 5 types of the device type(fully-automatic, semi-automatic, manual, handy, inline).
In addition, we have PN type checker, flatness, lifetime, TCR (temperature coefficient of resistance) and the spreading resistance measurement system.
* A fully customized product is also possible.

Fully-automatic system (with sample transfer system)

Contact type 〈P.5〉

WS-8800

RT-3000/RS-2000

Non-contact type 〈P.6〉

NC-6800

NC-60F/RS-1300

Semi-automatic system (Multi point measurement)

Contact type 〈P.7〉

CRESBOX

RT-3000/RG-2000

Non-contact type 〈P.8〉

NC-80MAP

CRN-100

Manual system (1point measurement)

Contact type 〈P.9〉

RT-70V/RG-7C

RT-70V/RG-7S

Non-contact type 〈P.10〉

EC-80

NC-10

Handheld instrument 〈P.11〉

DUORES

EC-80P

Built-in module 〈P.12~13〉

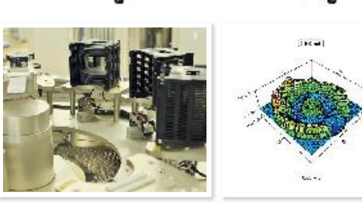
NC-700

NC-600

Flatness measurement ——— 〈P.13〉
PN type checker ——— 〈P.14〉
Lifetime measurement ——— 〈P.15〉
TCR measurement / Spreading resistance measurement ——— 〈P.16〉
4-point probe head ——— 〈P.17〉

Contact type : Fully-automatic system

WS-8800 Fully automatic(robotic transfer) 4 point probe system for silicon wafer



Selling Points

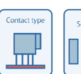
Measurement of resistivity, thickness, conductivity(P/N) and temperature
Tester self-test function, wide measuring range
Correction function for silicon resistivity(thickness,temperature, measurement position)
Number of cassette station can be changed by customers request
Host (CIM) communication and SMIF or FOUP compatible

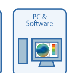
Details

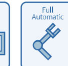
Applications
Semiconductor materials, Solar-cell materials (Silicon, Polysilicon, SiC etc)
Others (*Please contact us for details)

Sample sizes
3 ~ 8 inch (or 12 inch)

Measuring range
[R] 100μ~1M Ω·cm
[RS] 1m~10M Ω/sq

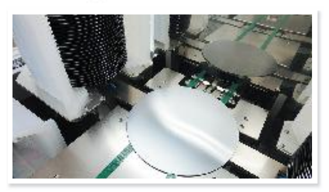






Non-contact type : Fully-automatic system

NC-6800 Non-contact measurement wafer sorting system (Belt drive transportation)



Selling Points

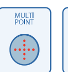
Non-contact measurement of resistivity, thickness and conductivity (P/N)
Number of cassette station can be changed by customers request
Eddy current method for resistivity, Electric capacitance method for wafer thickness
Temperature correction for silicon wafer function

Details

Applications
Semiconductor materials, Solar-cell materials (Silicon, Polysilicon, SiC etc)

Sample sizes
3 ~ 8 inch

Measuring range
[R] 1m ~ 200Ω·cm
[Thickness] 150 ~ 1200μm
*The range is separated from each Low, Middle, High and S-High probe type.
*Please refer the measurement range for each probe type as below;
①Low : 0.01~0.5Ω/sq (0.001~0.05Ω·cm)
②Middle : 0.5~10Ω/sq (0.05~0.5Ω·cm)
③High : 10~1000Ω/sq (0.5~60Ω·cm)
④S-High : 1000~3000Ω/sq (60~200Ω·cm)



RT-3000/RS-2000 Global standard model for 4 point probe sheet resistance automatic measurement system

Selling Points

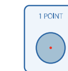
Fully automatic system for large sizes of flat panel with a customer glass loading robot
Multi-measurement system of sheet resistance, and optional thickness ,trancemittance and/or contact angle
Non-contact sheet resistance probe is avaialble as an option.
Self-test function, Measurement position correction function, wide measurement range
Min. 0.1 mm meas. pitch resolution and user programmable test pattern
Host (CIM) communication and 2-D/3-D Mapping software

Details

Applications
Conductive thin film (Metal, ITO etc)

Sample sizes
~2,880 x 3,080mm

Measuring range
1. RT-3000/S version;[RS] 1m~10M Ω/sq
2. RT-3000/H version;[RS] 10mΩ/sq~1GΩ/sq



NC-60F/RS-1300N Fully automatic non-contact sheet resistance measurement system for flatpanel display

Selling Points

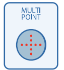
Global standard for non-contact measurement of ITO film, Metal thin films on flat panel
Automatic X-Y and Z (eddy current probe head) axis moving mechanism
Compatible with Loading robot for fully automatic measurement
Option :
Integlate to combined system (film thickness meter, etc)
Add 4 point probe measurement unit : RT-3000

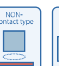
Details

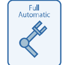
Applications
Conductive thin film (Metal, ITO etc)

Sample sizes
~ 2,880 x 3,080mm

Measuring range
[RS]
<1. for ITO> 5~800 Ω/sq
<2. for Metal thin film> 10m ~ 10Ω/sq
[ITO film thickness] 20 nm (200A)~500 nm (5,000A)

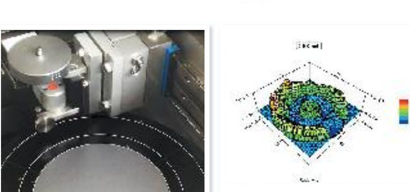






Contact type : Semi-automatic system

Cresbox　Small foot print model of semi-automatic 4 point probe sheet resistance/resistivity measurement



Selling Points

User programable measurement pattern & programmable measuring pattern
Tester self-test function, wide measuring range
Thickness, edge, temperature correction for silicon wafer
Film thickness conversion function from sheet resistance

Details

Applications

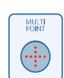
Semiconductor materilas, Solar-cell materials (Silicon, Polysilicon, SiC etc)
New materials, functional materials (Carbon nanotube, DLC, graphene, Ag nanowire etc)
Conductive thin film (Metal, ITO etc)
Diffused sample (or layer)
Silicon-related epitaxial materials, Ion-implantation sample
Others (*Please contact us for details)

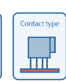
Sample sizes

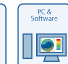
~ 8 inch, ~156x156mm

Measuring range

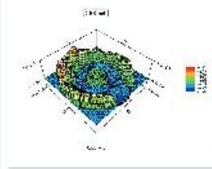
[R] 1m~300k Ω·cm
[RS] 5m~10M Ω/sq







RT-3000/RG-2000　Wide measurement range model of semi-automatic 4 point probe sheet resistance/resistivity measurement



Selling Points

User programable measurement pattern & programmable measuring pattern
Tester self-test function, wide measuring range
Thickness, edge, temperature correction for silicon wafer
Film thickness conversion function from sheet resistance

Details

Applications

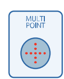
Semiconductor materilas, Solar-cell materials (Silicon, Polysilicon, SiC etc)
New materials, functional materials(Carbon nanotube, DLC, graphene, Ag nanowire etc)
Conductive thin film (Metal, ITO etc),Diffused sample (or layer)
Silicon-related thin films (LTPS etc), IGZO
Silicon-related epitaxial materials, Ion-implantation sample
Others (*Please contact us for details)

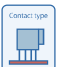
Sample sizes

~ 8 inch, ~156x156mm
-Option(Large size stage: Model RG-3000); ~12 inch, ~210x210mm

Measuring range

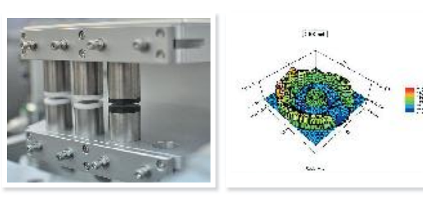
①RT-3000(S) version;
[R] 100μ~1M Ω·cm [RS] 1m~10M Ω/sq
②RT-3000(H) version;
[RS] 10mΩ/sq~1GΩ/sq





Non-contact type : Semi-automatic system

NC-80MAP　Non-contact sheet resistance multi-points measurement system with wide range



Selling Points

Possible to measure wide range of sheet resistance by installing Max. 4 probes
Min. 8 mm position from edge can be measured
User programable measurement pattern & programmable measuring pattern
*Option: thickness measurement probe (for silicon wafer)

Details

Applications

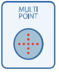
Semiconductor materials, Solar-cell materials (Silicon, Polysilicon, SiC etc)
New materials, functional materials (Carbon nanotube, DLC, graphene, Ag nanowire etc)
Conductive thin film (Metal, ITO etc),Silicon-related epitaxial materials, Ion-implantation sample
Chemical compound semiconductor (GaAs Epi, GaN Epi, InP, Ga etc)
Others (*Please contact us for details)

Sample sizes

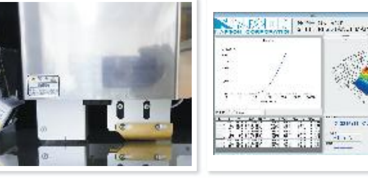
2 ~ 8 inch (Option; 12 inch)

Measuring range

[R] 1m ~ 200 Ω·cm
[RS] 10m ~ 3,000 Ω/sq
*The range is separated from each Low, Middle, High and S-High probe type.
*Please refer the measurement range for each probe type as below;
①Low : 0.01~0.5Ω/sq (0.001~0.05Ω·cm)　③High : 10~1000Ω/sq (0.5~60Ω·cm)
②Middle : 0.5~10Ω/sq (0.05~0.5Ω·cm)　④S-High : 1000~3000Ω/sq (60~200Ω·cm)



CRN-100　Non-contact Ultra-High range sheet resistance measurement system



Selling Points

Ultra-High range sheet resistance measurement for 10E+9 ~ 10E+15 ohm/sq without contacting
Mapping program software;
1. Arranged in a multipoint pattern measurement is programmed
2. 2-D & 3-D mapping software
Easy operation by Windows 7 system software
Measurement data base link with Excel via CSV format file
Unaffected by contact resistance
*Corona Discharge Method : Pat. No.5510629
Joint development with Yamagata Univ.
(Associate Professor : Dr. Toshiyuki Sugimoto)

Details

Applications

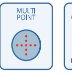
Any sample within the measurement range can be measured.
Thin film layer (a-Si, IGZO etc),Coating material,Semiconductor material
Approximate material as Insulator　*Please contact us for details.

Sample sizes

Size : Max. 300 x 400 mm (or more)　Thickness : Max. 2 mm
*We can design as your requirement. Please contact us for customize.

Measuring range

10E+9 ~ 10E+15 ohm/sq



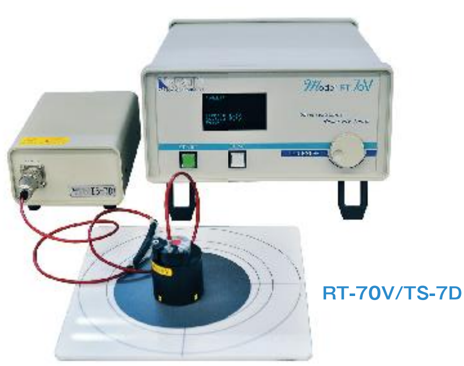
Contact type : Manual system

RT-70V series Combinational measurement system by Measurement tester(RT-70V) and Stage.

RT-70V/RG-7C

RT-70V/RG-5

RT-70V/RG-7S


RT-70V/TS-7D

Selling Points

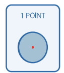
<Measurement tester ; RT-70V >
Thickness input with easy JOG dial operation (RT-70V Tester)
Tester self-test function/Auto change-over measurement range function

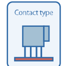
<Measurement stage>
*You can choose from following stage models by your purpose and applications.
①RG-7C
[Upper left] : Electric probe up-down stroke.
②RG-5
[Upper right] : Manual probe up-down stroke by handle lever.
③RG-7S
[Lower left] : Electric probe up-down stroke for Glass or Film sample using X-Y universal stage.
④TS-7D
[Lower right] :Hand held four point probe measurement instrument.
(*Stage plate is an option)

Details

Sample sizes
<RG-7C> ~300mm(12 inch), Thickness : ~10mm
<RG-5> ~200mm(8 inch), Thickness : ~10mm
<RG-7S> ~500 x 500mm, Thickness : ~10mm
<TS-7D> 20mm~

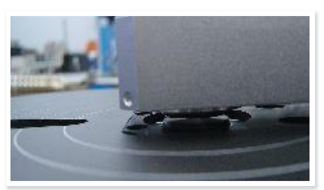
Measuring range
[R] 1μ~3M Ω·cm
[RS] 5m~10M Ω/sq





Non-contact type : Manual system

EC-80 Non-contact sheet resistance /resistivity measurement instrument



Selling Points

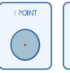
Easy operation and compact design
Auto-measurement start by inserting a wafer under the probe
Easy set up to measurement condition by JOG dial
5 types of model for each measuring range

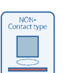
Details

Applications
Semiconductor materials, Solar-cell materials (Silicon, Polysilicon, SiC etc)
New materials, functional materials
(Carbon nanotube, DLC, graphene, Ag nanowire etc)
Conductive thin film (Metal, ITO etc)
Silicon-related epitaxial materials, Ion-implantation sample
Chemical compound semiconductor (GaAs Epi, GaN Epi, InP, Ga etc)
Others (*Please contact us for details)

Sample sizes
~8 inch, ~156x156mm

Measuring range
[R] 1m ~ 200 Ω·cm [RS] 10m ~ 3,000 Ω/sq
* The range is separated from each Low, Middle, High and S-High probe type.
*Please refer the measurement range for each probe type as below;
①Low : 0.01~0.5Ω/sq (0.001~0.05Ω·cm) ③High : 10~1000Ω/sq (0.5~60Ω·cm)
②Middle : 0.5~10Ω/sq (0.05~0.5Ω·cm) ④S-High : 1000~3000Ω/sq (60~200Ω·cm)





NC-10 Non-contact sheet resistance/resistivity measurement instrument with PC

Selling Points

Easy operation and data processing by PC
No damage measurement by non-contact eddy current method
Replaceable probes by meas. range (*Second or more probe is for the option)
1 point measurement of center position, 5 types of model for each measuring range
Temperature correction for silicon wafer function

Details

Applications
Semiconductor materials, Solar-cell materials (Silicon, Polysilicon, SiC etc)
New materials, functional materials (Carbon nanotube, DLC, graphene, Ag nanowire etc)
Conductive thin film (Metal, ITO etc)
Silicon-related epitaxial materials, Ion-implantation sample
Chemical compound semiconductor (GaAs Epi, GaN Epi, InP, Ga etc)
Others (*Please contact us for details)

Sample sizes
3 ~ 8 inch, ~156x156mm (Option; 2 inch and/or 12 inch, ~210x210mm)

Measuring range
[R] 1m ~ 200 Ω·cm [RS] 10m ~ 3,000 Ω/sq
* The range is separated from each Low, Middle, High and S-High probe type.
*Please refer the measurement range for each probe type as below;
①Low : 0.01~0.5Ω/sq (0.001~0.05Ω·cm) ③High : 10~1000Ω/sq (0.5~60Ω·cm)
②Middle : 0.5~10Ω/sq (0.05~0.5Ω·cm) ④S-High : 1000~3000Ω/sq (60~200Ω·cm)

Handheld instrument

DUORES Hand held Sheet resistance measurement instrument
[Replaceable probe set (Non-destructive probe & Contact probe)]

Selling Points

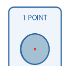
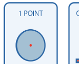
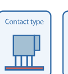
Easy to measure sheet resistance & carry around
Replaceable hand-held probes for Non-destructive & Contact type
・<NAPSON Original Technology> Replaceable hand-held probes for 2 kinds of measurement methods
<1> Non-destructivetype(Eddy current method)
<2> Contact type(4point probe method)
・Auto-measurement start by probe head unit put on/probe contact to sample
・Long-battery run time : 24h (*Battery-operated mode)
・Measurement data display : Max.100 data
・Measurement data save : Max.50,000 data
・Measurement data transfer by USB-Mini
・Measurement unit : Ω/sq, S/sq,n/m
・Data displayed by 4 digit floating decimal point
*Mainbody+Non-destructive probe set, Mainbody+Contact probe set are also available.

Details

Applications
Any sample within the measurement range
can be measured. (Films, Glass, Papers etc)
・Thin-film (ITO, TCOetc) ・Low-E-Glass ・CNT(Carbon nanotubes), Graphenmaterials
・Metals (nano-wires, grids, meshes, thin films) ・Others

Sample sizes
Any size and shape can be measured.(*Larger than measurement spot size)
<Measurement Spot size>
・Non-destructive probe(Eddy current type) : φ25mm
・Contact probe(4point probe type) : 9mm

Measuring range
・Non-destructive probe(Eddy current type) : 0.5~200 Ω/sq
・Contact probe(4point probe type) : 0.1~4000 Ω/sq

EC-80P(Portable) Hand held probe type eddy current sheet resistance/resistivity measurement instrument

Selling Points

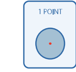
Auto-measurement start by probe head contacting to sample
3 measurement modes for wafer resistivity, bulk resistivity and sheet resistance
Easy set up to measurement condition by JOG dial
5 types of model for each measuring range
Resistivity probe can be changed by sample's resistivity range

Details

Applications
Semiconductor materials, Solar-cell materials (Silicon, Polysilicon, SiC etc)
New materials, functional materials (Carbon nanotube, DLC, graphene, Ag nanowire etc)
Conductive thin film (Metal, ITO etc)
Silicon-related epitaxial materials, Ion-implantation sample
Chemical compound semiconductor (GaAs Epi, GaN Epi, InP, Ga etc)
Others (*Please contact us for details)

Sample sizes
Any size and shape can be measured
(*Larger than 20mmφ and measurement plane must be flat)

Measuring range
[R] 1m ~ 200 Ω·cm [RS] 10m ~ 3,000 Ω/sq
*The range is separated from each Low, Middle, High S-High, Solar-wafer probe type.
*Please refer the measurement range for each probe type as below;
①Low : 0.01~0.5Ω/sq (0.001~0.05Ω·cm)
②Middle : 0.5~10Ω/sq (0.05~0.5Ω·cm)
③High : 10~1000Ω/sq (0.5~60Ω·cm)
④S-High : 1000~3000Ω/sq (60~200Ω·cm)
⑤Solar-wafer : 5~500Ω/sq (0.2~15Ω·cm)



Buit-in module

NC-700 Non-contact Inline sheet resistance measurement module for Conductive layer on substrate

Selling Points

Inline measurement module for moving substrates such as PET film, glass or paper
Continuous measurement(~24h) in Roll to Roll with OFF-SET FREE capability system
Various applications from the research and development to the production line

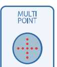
Details

Applications
New materials, functional materials
(Carbon nanotube, DLC, graphene, Ag nanowire etc)
Conductive thin film (Metal, ITO etc)

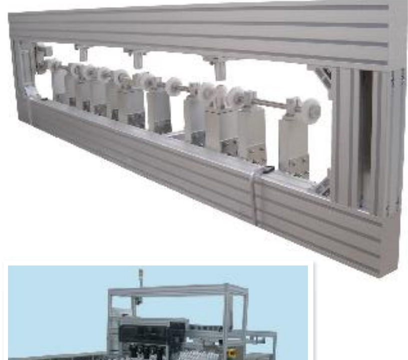
Sample sizes
Please contact us in details

Measuring range
10~1000 Ω/sq [Standard range type]
(* Select a range from 1m ~2000 Ω/sq. Please contact us in details)
*Numbers of probe module : Selectable

Related product
For vacuum chamber environment : NC-700V
Adding transmittance measurement function : NC-700+TR



NC-600 Non-contact Inline sheet resistance measurement module for flat panel display



Selling Points

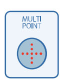
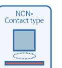
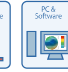
Non-stop and non-contact sheet resistance measuring of thin film on glass runs through on conveyer
1 to 10 number of probe by sizes of glass is attachable
Glass collision prevention function
Continuous test data report to the host computer

Details

Applications
New materials, functional materials
(Carbon nanotube, DLC, graphene, Ag nanowire etc)
Conductive thin film (Metal, ITO etc)

Sample sizes
~ 2,880 x 3,080mm

Measuring range
10~1000 Ω/sq [Standard range type]
(* Select a range from 1m ~2000 Ω/sq. Please contact us in details)
*Numbers of probe module : Selectable

Buit-in module / Flatness measurement

NC-110(NC-110PV) Non-contact Inline resistivity measurement module

Selling Points

Possible to measure sheet resistance without contact by Max. 3 types of probes
Suitable for production line and tranceportation system
Connect to host PC by LAN to send measurement command and data

Details

Applications

Semiconductor materials, Solar-cell materials (Silicon, Polysilicon, SiC etc)
New materials, functional materials (Carbon nanotube, DLC, graphene, Ag nanowire etc)
Conductive thin film (Metal, ITO etc)
Silicon-related epitaxial materials, Ion-implantation sample
Chemical compound semiconductor (GaAs Epi, GaN Epi, InP, Ga etc)
Others (*Please contact us for details)

Sample sizes

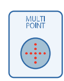
2 ~ 8 inch, ~156x156mm (Option; ~12 inch, ~210x210mm)

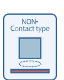
Measuring range

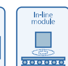
[R] 1m ~ 200 Ω·cm (NC-110PV : 0.2 ~ 20 Ω·cm for solar wafer) [RS] 10m ~ 3,000 Ω/sq
*The range is separated from each Low, Middle, High and S-High probe type.
*Please refer the measurement range for each probe type as below;
①Low : 0.01~0.5Ω/sq (0.001~0.05Ω·cm) ③High : 10~1000Ω/sq (0.5~60Ω·cm)
②Middle : 0.5~10Ω/sq (0.05~0.5Ω·cm) ④S-High : 1000~3000Ω/sq (60~200Ω·cm)

Related product

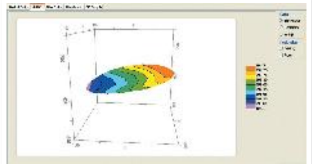
Resistivity + Thickness measurement module : NC-110-T, NC-110PV-T







FLA-200 Wafer flatness measurement system



Selling Points

Measures Thickness, TTV, Bow, Warp and site and global Flatness (ASTM compliance)
Measures all materials including Si, GaAs, Ge, InP, SiC
Full 500 micron thickness measurement range without re-calibration
2-D /3-D Mapping software

Details

Applications

Semiconductor materials, Solar-cell materials (Silicon, Polysilicon, SiC etc)
Silicon-related epitaxial materials, Ion-implantation sample
Chemical compound semiconductor (GaAs Epi, GaN Epi, InP, Ga etc)

Sample sizes

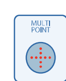
3~8 inch

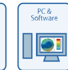
Measuring range

Thickness: 200~1200㎛ Bow : +/-350㎛ Warp: 350㎛

Related product

Wafer flatness sorting system : NC-2000(Robotic carrier), NC-6800(Belt carrier)
*Adding Resisitivity measurement module and/or PN checker module system is also available.





PN type checker

PN-8LP Portable pen-type non-contact PN checker

Selling Points

Principle: Photovoltaic effect with the 650nm laser diode
Power supply : DC1.5V(size AA alkaline battery), 300mA
Display of judgement : P(red) or N(green) LED lamps

Details

Applications

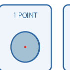
Semiconductor materials, Solar-cell materials (Silicon, Polysilicon, SiC etc)

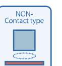
Sample sizes

*Possible size to laser measurement

Measuring range

PN Checking range in resistivity : 0.02~5,000Ω·cm





PN-12α·PN-50α PN type checker ; Contact type(PN-12α) & Non-contact type(PN-50α)

PN-12α

Selling Points

Principle: Themo-electromotive force(seebek effect)
Possible to check most figure of sample such as single crystalline silicon wafer, bulk, ingot and so on
*Please select from 2 types;
1) 2 probe ver.(Hot probe, Cold probe),
2) 1 probe ver.(Hot & Cold probe)

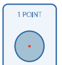
Details

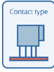
Sample sizes

more than 2 inch

Measuring range

PN Checking range in resistivity : 1m ~ 20k Ω·cm
*Polycrystalline silicon、thin film on wafer、MultiOxidized film on wafer surface are can not judgement





PN-50α

Selling Points

Principle: Photovoltaic effect by light pulse irradiation
No damage and no stain by Non-contact method
Possible to check even oxidized film on wafer surface
Instantly discrimination by optical pulse illuminate

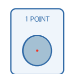
Details

Sample sizes

more than 30x30mm

Measuring range

PN Checking range in resistivity : 0.1~1,000Ω·cm



Lifetime measurement

HF-90R Life-time measurement system for silicon bulks / ingots with non-contact

Selling Points

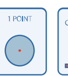
Silicon bulk, Prismatic shape (JIS code), Ingot condition
Non-contact photoconduction vibration decay method
Data processing by digital oscilloscope and PC with software

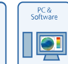
Details

Applications
Silicon ingot, Silicon bulk, Prismatic shape (JIS code)

Sample sizes
*Please contact us in details

Measuring range
100 ~ 5,000μS (in the range of 10 ~ 5,000Ω·cm)





HF-100DCA Life-time measurement system for silicon bulks/ingots by JIS method

Selling Points

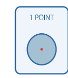
Global standard model for the lifetime test of silicon bulk
JIS direct current anodizing method
Data processing by digital oscilloscope and PC with software

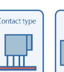
Details

Applications
Silicon ingot, Silicon bulk, Prismatic shape (JIS code)

Sample sizes
*Please contact us in details

Measuring range
50 μS~ 20mS





TCR measurement / Spreading resistance measurement

TCR-600 4 point probe sheet resistance/resistivity measurement with temperature controled system

Selling Points

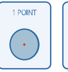
Controlled Thermo-chuck
(room temperature~600℃/less than 20 minutes)
600C compatible probe head with 1mm linear
Controlled with vacuum sensor, digital thermo-meter,
vacuum gauge and gas flow meter
Temperature measuring accuracy:±(0.5% + 1℃)

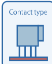
Details

Applications
Semiconductor materilas, Solar-cell materials (Silicon, Polysilicon, SiC etc)
Conductive thin film (Metal, ITO etc)
Others (*Please contact us for details)

Sample sizes
ϕ10mm or 5mmX10mm~35mmX35mm or others

Measuring range
10μ~100k Ω·cm





SRS-2010 Spread resistance for slanting polished sample of semiconductor by tow kinematically-mounted probe contacting.

Selling Points

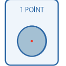
Resitivity map along with depth direction, thickness of epitaxial,
depth of PN junctin and carier density profiles

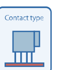
Details

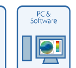
Applications
Semiconductor materials, Solar-cell materials (Silicon, Polysilicon, SiC etc)

Sample sizes
Please contact us in details

Measuring range
1~10E+9 Ω[Spread restance]
Carrier density range:2E+13 ~ 5E+19 cm2 [N-type silicon]
2E+14 ~ 7E+19 cm2 [P-type silicon]







4-point probe head

4-point probe head Cartridge type, Cylindrical type, Miniature type, Cartridge with 6-way connector socket type

①Cartridge type (Napson original)

③6-way connector socket type

②Miniature type

④Cylindrical type

Selling Points

Napson 4-point resistivity / sheet resistance systems are using high performance probe heads which are made by Jandel Engineering Limited of England.

Jandel probe head performs high precise measurement of resistivity and sheet resistance for silicon wafers, epitaxial layers, diffusion layers, ITO layers, metal layers and more, so that Jandel probes have a good evaluation for many years.

*Load (needle pressure) is always suitable since using V type spring
*Probe spacing accuracy and probe stability is excellent since anodized aluminum alloy upper and lower guides are jeweled
*Less damage of probe needle tips – Solid tungsten carbide needles for superior durability

Details

Applications

The probe type is chosen under the material of measuring sample, the surface state, the form etc.

Measurement sample	Probe head(Material/Radius)	Load/Needle
Silicon Ingots / Block	TC-40μ	200g
Silicon Slice	TC-40μ	200g
Epitaxial Layers	TC-150μ	100g
Epitaxial Layers (Thin film)	TC-150μ, 500μ	50g
Shallow Diffused -layers (Thin film)	OS-200μ, 500μ	50g
Diffused Layers	OS-200μ, TC-150μ	100g
Ion Implantation	TC-150μ	50g, 100g
Metal (Thin film)	TC-150μ, 500μ	10g, 50g, 100g
ITO layer	TC-150μ, 500μ	10g, 50g, 100g

*The other types are available.
*If you would like to have a special spec, contact us.
<Specifications>
e.g) TC-40u-200g/1.00mm
– Needle Material: TC [Tungsten carbide] (or OS: Osmium alloy)
– Radius: 40 um (25 um to 500 um)
– Loads (g/needle): 200g (10g to 250g)
– Spacing: 1.00 mm (0.5 mm to 1.59 mm)
– Arrangement: Linear (standard) (Square is available)

Measurement principles of Resistance

(Contact type: 4 point probe method, Non-contact type: Eddy-current method)

Explain about the typical 2 types of electric resistance measurement principle in this page.

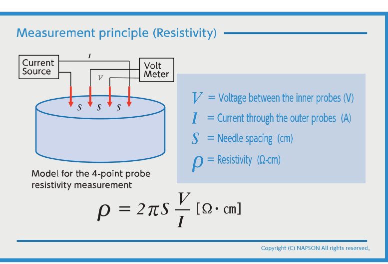
*For the measurement principle other than followings, please contact us.

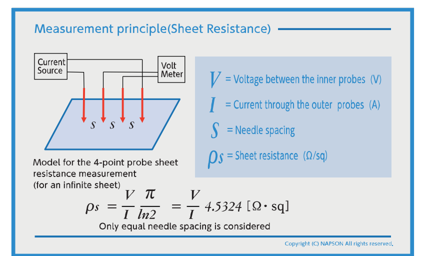
Contact type: 4 point probe method

4 point probe method is mainly used in the case of a contact type.
It can measure the 1E-3 (1m) ~ 1E + 9 (1G) Ω / □ level of resistance range.
This is the most basic measurement technique in the electrical resistance measurement.

4 point probe method will be carried out measured by the following procedure.
❶Put on a straight line the four needle electrodes to the measurement sample.
❷Apply the constant current to between outer two needle.
❸Measuring the potential difference between inside two needle to lead the resistance.

Resistivity and sheet resistance will measured by the same method and procedure.(Please refer figures below)





Non-contact type: Eddy-current method

Eddy current method is used mainly in the case of a non-contact type. It can measure the 1E-3 (1m) ~ 1E + 4 (10k) Ω / □ level of resistance range.
This method is mainly used in the production site (Especially Semiconductor, thin-films on flat panels, carbon-based new material).

Measurement system by the eddy current method measures the resistance by utilizing an eddy current generated by electromagnetic induction.
The probe unit is composed of couple of probe cores(upside and downside) which is disposed between a fixed distance.

Eddy current method will be carried out measured by the following procedure.

(1) Generating a magnetic flux by adding the high frequency between the probe core. When insert a sample to this magnetic flux, eddy current is generated in the sample.

(2) At this time,
❶An eddy current flows through the sample
❷Current is consumed within the sample, power attenuation occurs.
❸Current in the circuit is reduced in proportion to it.Detect this reduced current value.

(3)Resistance of the detected current value is inversely proportional to the sample's resistance value.
By using this inverse relationship, Derive the sheet resistance(or resistivity) from the calculating formula(of the current value and sheet resistance).
(*To derive the resistivity, thickness information of the sample is needed)