MDPpro

Mono- and Multi-crystalline wafer and brick lifetime measurement device

for routine quality control and sophisticated material research & development

Si | compound semiconductors | oxides | wide bandgap materials | perovskites | epitaxial layers

[CdTe | InP | ZnS | SiC | GaAs | GaN | Ge]

Routine Lifetime Measurement Quality Control & Inspection

Best throughput: >240 bricks/day or >720 wafers/day

Measurement speed: < 4 minutes for a 156 x 156 x 400 mm standard brick

Yield improvement: 1 mm cutting criteria for a 156 x 156 x 400 mm standard brick

Quality control: designed for quality monitoring of processes and materials like mono or multi-crystalline silicon

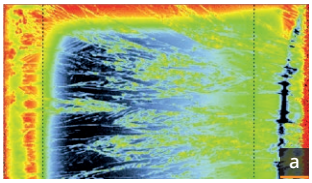
Contamination determination: metal (Fe) contaminations originated in crucibles and equipment

Reliability: modular and rugged industrial instrument for higher reliability and uptime > 99%

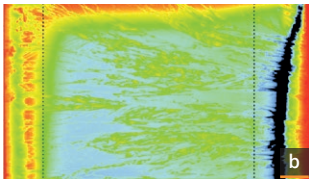
Repeatability: > 99.5%

Resistivity: resistivity mapping without frequent calibration

+ Contactless and destruction free lifetime imaging (µPCD/ MDP (QSS), photoconductivity, resistivity and p/n check according to semi standard SEMI PV9-1110
+ Wafer cutting, Furnace monitoring, Material optimization and more



a. Lifetime (τ) map of multi-crystalline Si brick with automated determination of cut criteria



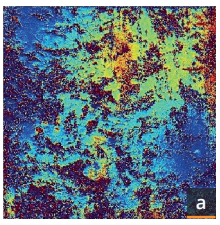
b. Spatially resolved p/n conduction type transformation detection

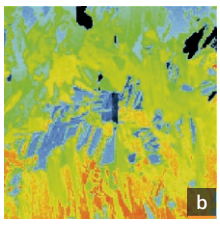
c. Resistivity map of multi-crystalline Si brick

Sophisticated Material Research & Development

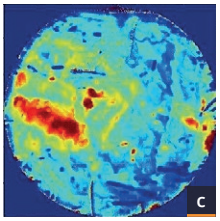
Few examples for research applications

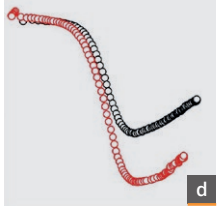
+ Iron concentration determination
+ Trap concentration determination
+ Boron oxygen determination
+ Injection dependent measurements and more





a. Iron density map
b. Reflection map



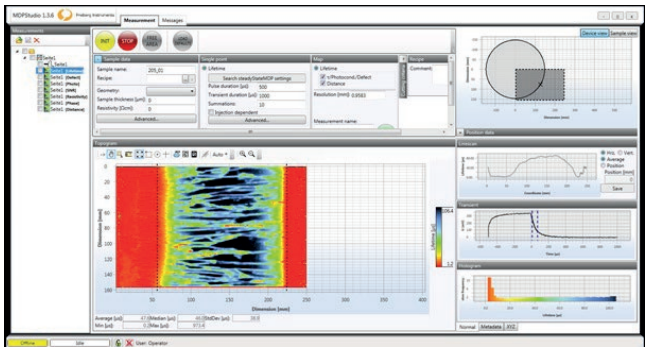


c. Relative boron oxygen, density map
d. Injection dependent lifetime curves with trapping

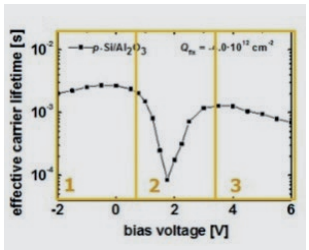
MDPStudio

User-friendly and advanced operating software with:

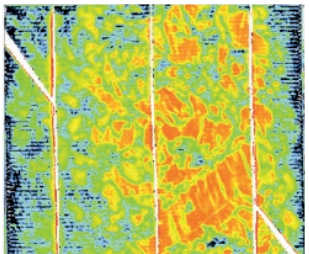
- Export and import functions
- User structure with operator
- Overview over all performed measurements
- Sample parameter input
- Single point measurements e. g. injection dependent measurements
- Mapping options
- Recipes
- Package of analysis functions
- View of linescans and single transients



Remote accessibility: IP based system allows remote operation and technical support from anywhere in the world.



Effective carrier lifetime vs. Bias voltage for Qfix determination



Typical LBIC measurement of multi-crystalline Si solar cell

Relevant products

MDPspot

MDPmap

Optional add on

- Spot size variation
- Resistivity measurement (bricks/wafers)
- Reference wafer
- Sheet resistance
- Background/Bias light
- Reflection measurement (MDP)
- LBIC
- BiasMDP
- LBIC, BiasMDP measurement stage with contacts
- Internal iron mapping of Si
- P/N detection
- Bar code reader
- Wide range of lasers

Technical specifications

Material	Multi- and Mono-crystalline silicon
Sample size	**Brick** between 125 x 125 to 210 x 210 mm², maximum brick length: 500 mm **Wafer** up to 300 mm diameter (standard), up to 450 mm diameter (on request), down to 5 x 5 mm
Resistivity	0.2 – >10^3 Ohm cm
Conduction type	p, n
Measureable properties	lifetime - µPCD/MDP (QSS), photoconductivity
Excitation	select up to four different wavelengths from 355 nm up to 1480 nm. 980 nm (default)
Laptop or PC requirements	Windows 7 or latest, .NET Framework update, 2 Ethernet ports
Power requirements	100 – 250 V AC, 6 A
Dimensions	1000 x 720 x 1500 mm
Weight	ca. 200 kg
Certification	manufactured under ISO 9001 guidelines, CE conform

VQZ Bonn Zertifiziert DIN EN ISO 9001

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