

VUV-R APPLICATIONS

- High-k dielectric materials
- Ultra-thin layer < 10 nm
- Layer thickness mapping
- Material concentration
- Optoelectronics
- Photovoltaic

CONTACT

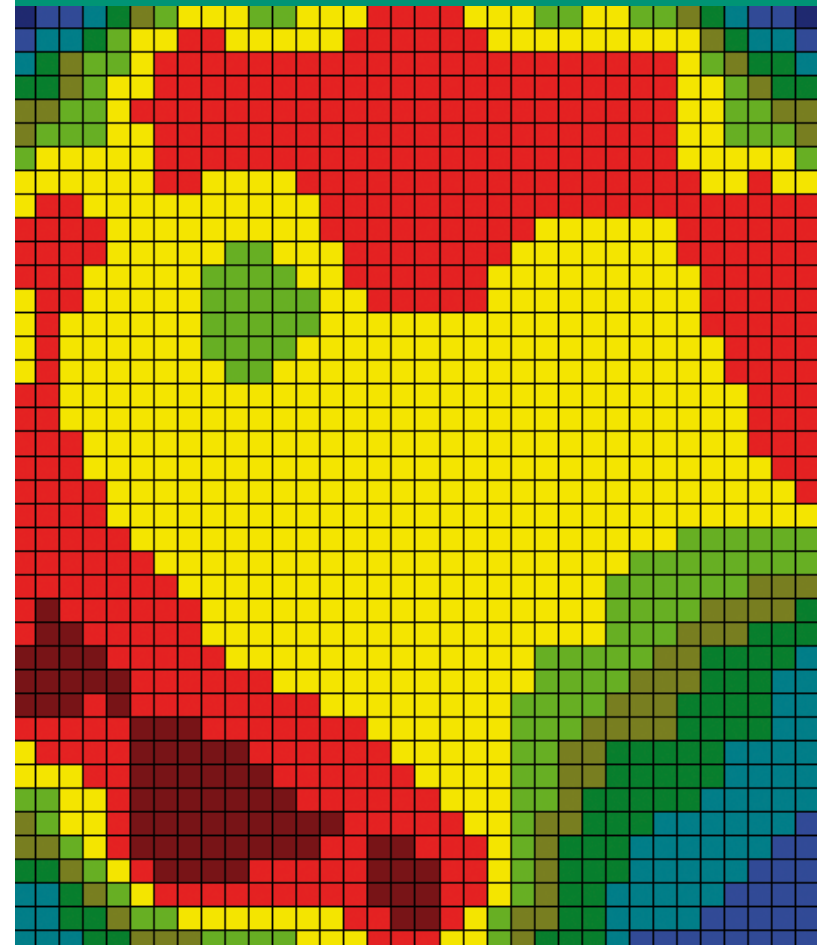
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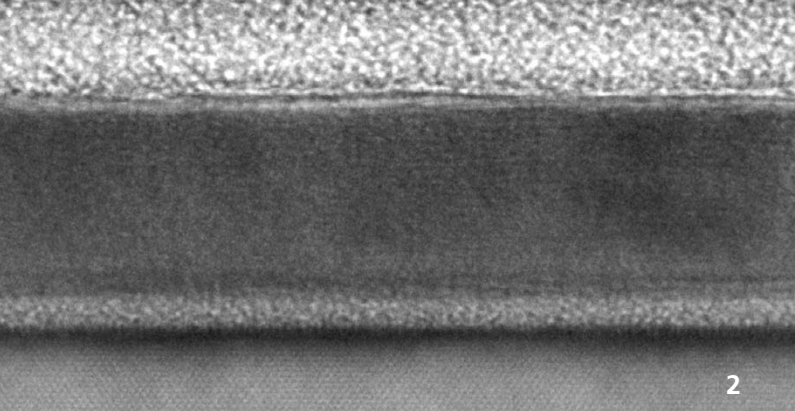
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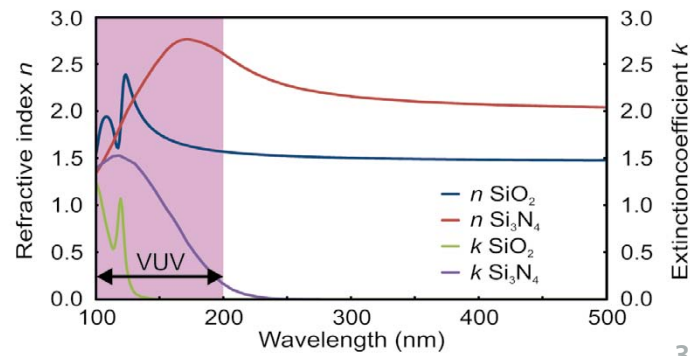


VACUUM ULTRA-VIOLET REFLECTOMETRY (VUV-R)

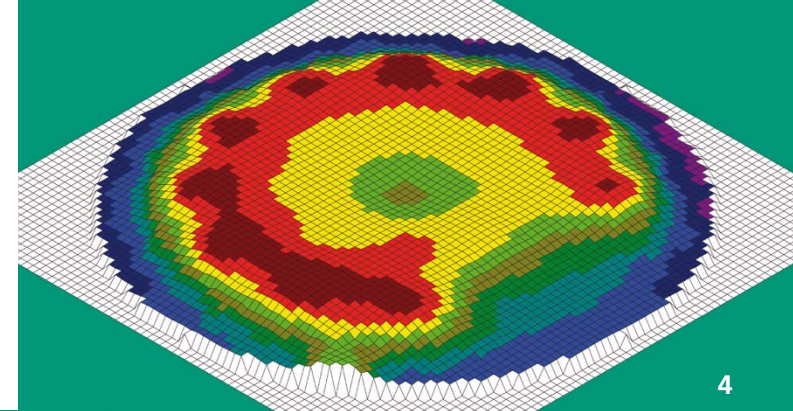




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VUV-R PROPERTIES & BENEFITS

Ultra-thin film measurement

- Non-destructive dielectric film characterization for new applications in semiconductor manufacturing
- Film composition and material concentration
- Multi-layer characterization

Fully automated measurement

- Spectral region 120 nm - 800 nm
- 200 mm - 300 mm wafer
- Small spot size 35 μ m x 35 μ m
- Unpatterned and patterned

High throughput

Fast wafer mapping

Materials

- E.g. SiO₂, Si₃N₄, Al₂O₃, Hf-based oxides, ONO, TiO₂, ZrO₂

2 TEM reference measurement of a typical high-k film

PRINCIPLE OF VUV-R*

- Key semiconductor materials have unique absorption peaks at short VUV wavelengths < 200 nm
- Characterization of ultra thin layers by saturation of the absorption properties at DUV and VUV by acquisition of the band gap
- Layer separation due to different material properties
- Measurement of difference in the intensities between the light reflected from the sample and the incidence light source

* VUV: Vacuum Ultra Violet Wavelengths, 100 nm - 800 nm

3 Change of the optical properties of SiO₂ and Si₃N₄ in the VUV region

OUR OFFERS

R&D activities

- Characterization of new high-k dielectric materials
- Calculation of optical properties
- Measurement of film thickness and material concentration
- Detection of surface contamination

Standard measurements

- Layer thickness
- Material concentration
- Wafer mapping

4 Nitrogen concentration map of 20 Å high-k film measured by VUV-R