THERMAL IMAGING MICROSCOPE AND APPLICATIONS

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More powerful and faster micro-electronic devices mean hotter devices, which can lead to a decrease in performance and lifetime. Thus, thermal analyses of micro-electronic devices, such as surface temperature profile measurements and localized heat generation detection under their operating conditions, have become an important factor in the development of semiconductor devices. Several thermal imaging and analysis techniques, such as scanning thermal microscopy, micro-Raman thermography, infrared micro-thermography, and thermoreflectance microscopy have been developed to investigate thermal properties in micro- and nano-scale devices.

In this presentation, we demonstrate quantitative micro-thermography, including infrared micro-thermography [1] and thermoreflectance microscopy [2,3]. Several applications of micro-thermography, such as quantitative measurement of the surface and sub-surface temperature distribution of semiconductor devices [4,5], hot spot detection for failure analysis of semiconductor integrated circuits [6], and detection of defects in optical materials [7], will be presented. We will also discuss about application capability of the thermal imaging microscope to photo-thermal characterization of gold nano-particles for photo-thermal therapy.

References;

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