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Multi-level authentication platform using electronic nano-signatures

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We report the development and demonstration of a unique multi-level authentication technology employing electronic nano-signatures (ENS). The development and demonstration of different counterfeit detection technologies extending from optical inspection to rather sophisticated x-ray imaging are yet to be consolidated such that counterfeit identifications are conclusive and without any false positives. Counterfeit detection still has much intrinsic subjectivity, and thus the confidence level of the associated results is lacking.

Engineered submicron features, in the form of meta material, written on IC capping material are being proposed as a tool for the identification of counterfeit ICs. The submicron signature, invisible to the naked eye but visible under high magnification optical microscopes (>1000x), modify the optical properties of the capping material and is detected by using inexpensive and fast optical probing such as shining a laser pointer on the surface of the IC.

All three levels of authentication are based upon (a) using a mobile communication platform (e.g. smart phone) to record the images followed by (b) image processing either on the mobile platform or utilizing cloud computing environment. The technique provides a fast and highly reliable authentication technology that is mobile, cheap and operator independent.

Biography

Mehdi Anwar serves as an Editor of IEEE Journal of Electron Devices and has served as an Editor of the IEEE Transactions on Electron Devices (2001 - 2010). He is the Guest Editor of an upcoming issue of Optical Engineering. He serves as the conference chair of the international conference on Terahertz Physics, Devices and Systems: Advanced Applications in Industry and Defense of the SPIE Defense, Security and Sensing (2009, 2010, 2011, 2012). He has also chaired the 2006 and 2007 Terahertz Physics, Devices and Systems Conference as part of SPIE's Optics East. Anwar is a SPIE fellow.

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