

### **Photovoltaic effect in hydrogenated Silicon nano-crystalline thin films**

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#### **Abstract**

The temperature and illumination effect on the photoconductivity of low impedance hydrogenated nanocrystalline silicon nc-Si:H thin films has been investigated. It was found that, for illumination intensities less than 41 klux, the photoconductivity activation energy is sensitive to the incident illumination intensity. At fixed temperature and variable illumination intensity, the photocurrent follows the relation (the value of the exponent,  $\gamma$ , varying from 0.36 to 0.83); the illumination dependence of photoconductivity indicates the domination of sublinear (bimolecular) and of linear (monomolecular) recombination mechanisms in temperature range of (353-393 K) and (303-343 K) respectively.