PHYSICS BASED MODELING OF ELECTROMIGRATION-INDUCED DEGRADATION PHENOMENA IN COPPER INTERCONNECTS

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In memory of the excellent scientist and the great man

PETER BENDIX

OUTLINE

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- ❖ Introduction
- ❖ EM-induced stress sources
  - ▪ Inelastic component: vacancy & plated atom related dilatation
  - ▪ Elastic component: interaction with a confinement
  - ▪ Vacancy equilibration with the total stress
- ❖ Metal texture related effects
  - ▪ Grain boundaries (GB) as the sources of vacancy/plated atom generation-annihilation and channels for vacancy diffusion
  - ▪ Texture-induced inter-grain variations in elasticity constants
- ❖ Stress evolution in copper segments
- ❖ Void dynamics

Via-Contact Etch Model