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(71) Applicant: **MICRON TECHNOLOGY, INC.** [US/US]; 8000 South Federal Way, Boise, ID 83716 (US).

(72) Inventors: **ZHENG, Lingyi, A.**; 2535 E. Red Cedar Lane #202, Boise, ID 83716 (US). **PING, Er-Xuan**; 2239 E. Chateau Drive, Meridian, ID 83642 (US).

(74) Agent: **LEFFERT, Thomas, W.**; Fogg, Slifer & Polglaze, P.A., P.O. Box 581009, Minneapolis, MN 55458-1009 (US).

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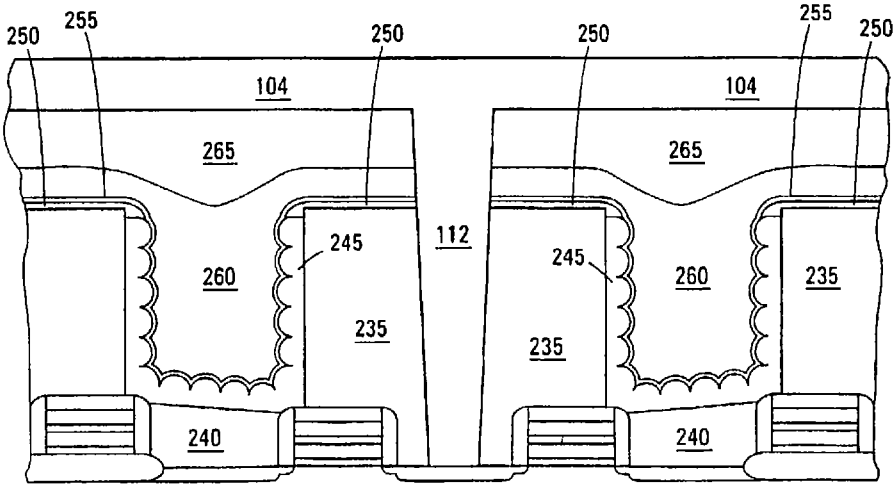
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(54) Title: REDUCTION OF DAMAGE IN SEMICONDUCTOR CONTAINER CAPACITORS

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(57) Abstract: Semiconductor container capacitor structures having a diffusion barrier layer to reduce damage of the bottom cell plate and any underlying transistor from species diffused through the surrounding insulating material are adapted for use in high-density memory arrays. The diffusion barrier layer can protect the bottom cell plate any underlying access transistor and even the surface of the surrounding insulating layer during processing including pre-treatment, formation and post-treatment of the capacitor dielectric layer. The diffusion barrier layer inhibits or impedes diffusion of species that may cause damage to the bottom plate or an underlying transistor, such as oxygen-containing species, hydrogen-containing species and/or other undesirable species. The diffusion barrier layer is formed separate from the capacitor dielectric layer. This facilitates thinning of the dielectric layer as the dielectric layer need not provide such diffusion protection. Thinning of the dielectric layer in turn facilitates higher capacitance values for a given capacitor surface area.

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