Variation-Aware X-Topology Architecture with Local Ground References for Broadband Characterization of Passives

Abstract:
X-Topology architecture accounting for distributed floating local ground references is proposed for variation-aware design and characterization of passives. The ability of the proposed solution to map physical design parameters into broadband physics-based equivalent circuit model extraction is demonstrated based on design of low-loss integrated coplanar strip (CPS) lines on anisotropic DTI (Deep-Trench Insulator) patterning realized in advanced SiGe BiCMOS technology. Perspectives for use of X-topology in enabling Q-controllable components with compact broadband equivalent circuit representation fully scalable with respect to the device geometry and architecture are drawn.