Abstracts

Accurate modeling of metal plate-loaded loop-coupled cavities with slots

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In this work, we analyze the problem of the electromagnetic field radiated from apertures in coaxial fed metal enclosures loaded with metal inserts. Such situations are found, for example, in PC environments where slots and apertures are used for the purpose of heat dissipation, CD-ROMs, cable penetration etc. We derive an accurate model of the entire structure, including the coaxial line-to-loop-to-cavity feed and the inner metal planes, simulating the presence of the circuitry inside. The analysis is developed by means of the hybrid transmission line matrix-integral equation (TLM-IE) method and theoretical results are compared with experimental ones showing very good agreement. The evaluation of the reflection coefficient and of the level of radiated emission as functions of the metal plates position is very helpful toward the engineering design of the entire structure. The numerical simulations require rather low computational effort.

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