

# Diffraction of an electromagnetic wave by gaps between plates

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## Abstract

The problem of diffraction of a plane TE-polarized electromagnetic wave by gaps between metal plates located in the same plane is investigated. The diffraction problem is formulated as a boundary-value problem for the Helmholtz equation with the boundary conditions on metal and a given asymptotic behavior at the edges of the screens. The solutions are sought in the class of waves propagating to infinity. The problem under consideration is reduced to an integral equation with a strongly singular kernel with respect to the trace of the electric field vector in the gap. In turn, the integral equation is reduced to an infinite system of linear algebraic equations with respect to the expansion coefficients of the derivative of the sought function. Some singular integrals involving generalized Chebyshev polynomials are analytically calculated. © 2012 Pleiades Publishing, Ltd.

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## Keywords

diffraction, generalized Chebyshev polynomials, hypersingular integral equation, TE-polarized electromagnetic wave