

EMSight Proximity to Enclosure Issues

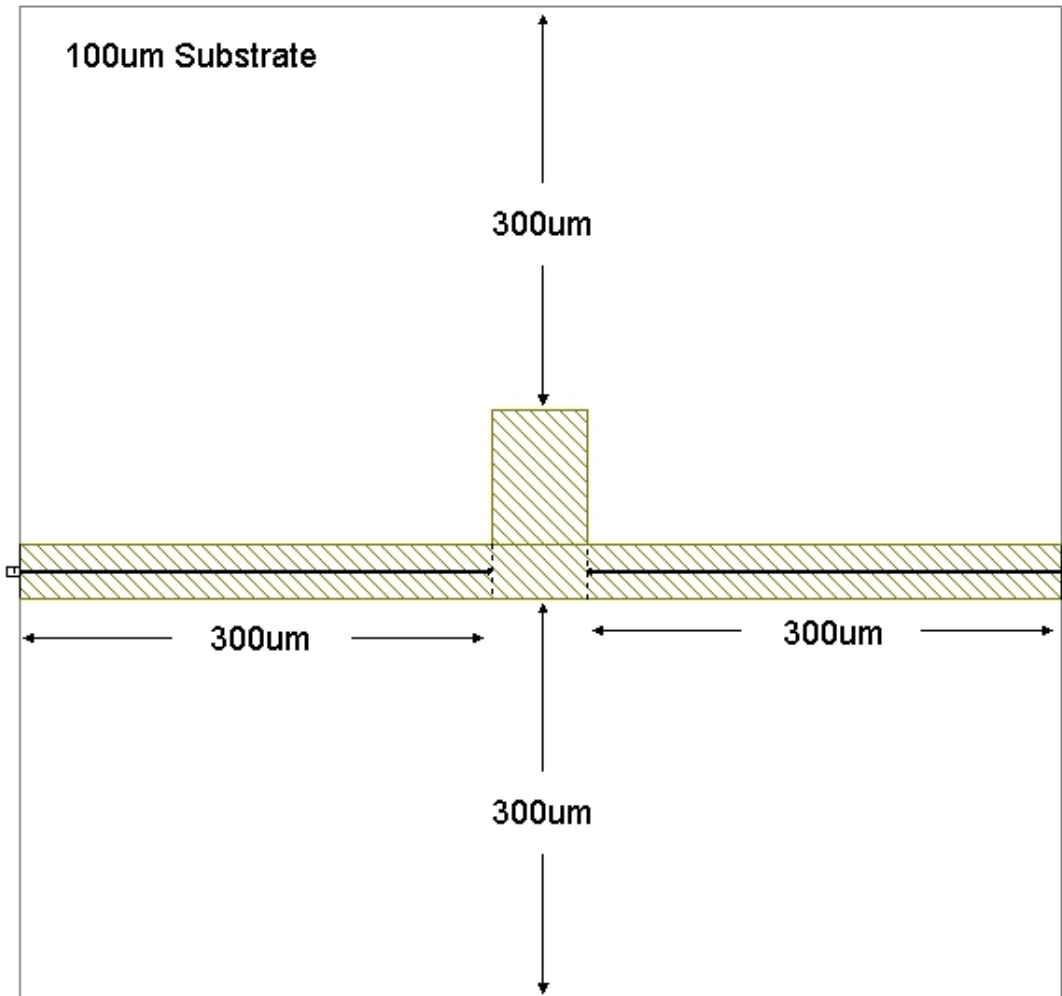
Problem

How much space do I need between the conductors and the sidewalls in an EM structure?

Solution

This article describes a simple method for determining the appropriate spacing between the sidewalls of an EM structure and the conductors.

EMSight models the structure sidewalls as perfect conductors, so placing a conductor nearby will add shunt capacitance. Therefore, you will want to make your structure large enough to include the conductors you are trying to simulate, plus two or three substrate heights of space between each wall and the conductors. (Please see attached picture below).



To be sure you have enough space, you might want to set up a simplified version of your structure. Use the same substrates, but reduce the grid resolution, and draw a single conductor about 1/4 wavelength long at your highest frequency of interest (F_{hi}). One side of the conductor should attach to the wall, where you will connect a port, and the other side should stop 1 substrate height short of the far wall. Set the structure to simulate at F_{hi} . Now, you can run multiple simulations of the structure quickly, increasing the box size each time to have more and more distance between the open end of the conductor and the wall. When the magnitude and angle of S_{11} change less than the desired amount, you have found the minimum wall spacing for your structure.