

Figure 1: Simple line coupler model (.s4p file) with reflected cancellation for high directivity.

Case 1: If port 4 is internally terminated with 50Ω on chip. According to your equation, I will get the directivity by $D=S_{31}/S_{32}$.

Case 2: if Port 4 is also a port, then, according to the directivity's definition, $D = S_{31}/S_{41}$.

So, in these two cases, nothing has changed. But the results are so different, as shown below,

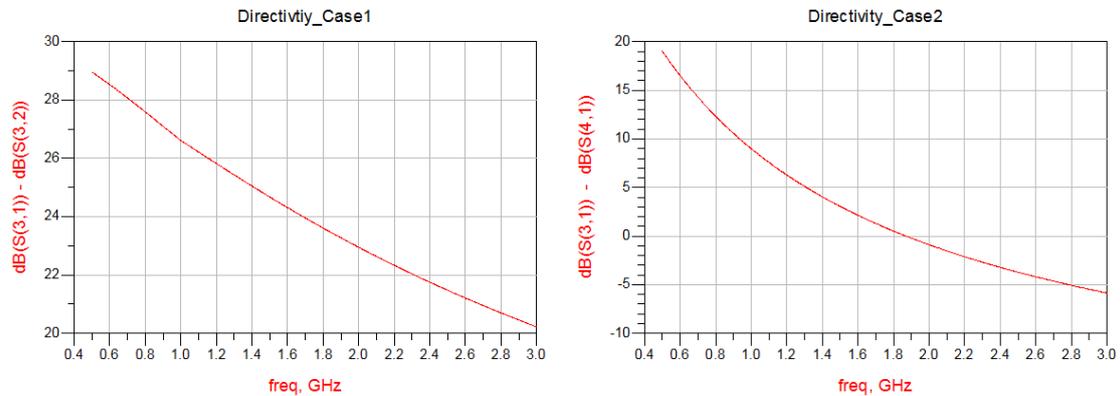


Figure 2: Directivity simulation results obtained from Case 1&2.

In this case, which one is correct?