Abstracts

Series Stacked Varactors for High Power, High Frequency Applications

W. Jann, T. Miles and J. DiBona. "Series Stacked Varactors for High Power, High Frequency Applications." 1967 G-MTT International Microwave Symposium Program and Digest 67.1 (1967 [MWSYM]): 154-156.

In 1965 Irwin and Swan of BTL, and also Varian Associates in February 1967, demonstrated that series-connecting of two or more varactors enables one to obtain on the order of five times increase in power handling capability of a varactor multiplier, compared to a single element device. They showed that the total BVR is the sum of the BVR's of the individual devices, the C/sub j/ is the series sum of the capacitances, and the f/sub c/ is approximately equal to that of the individual chips. If N devices are series-connected and if the capacitance of the assembly is to be kept constant, the individual chip can have a value of capacitance approximately N times as large as that of the series-connected assembly. This can provide a thermal resistance decreased by about the same ratio, provided adequate heat sinking is provided. The author of the above papers partially demonstrated the possible advantages of series connection of varactors by soldering two, three or four packaged varactors together, one on top of the other. They did not realize the full power dissipation capability of series-connected varactors, because, in their assemblies, only the bottom varactor which was attached to the heat sink, was efficiently cooled.

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