State of the art millimeter-wave packages

Over the last few decades, tremendous progress has been made in semiconductor technologies e.g. SiGe, GaAs, InP etc. which has pushed their cutoff frequencies to nearly 700 GHz till the present day. Therefore, semiconductor MMICs operating way beyond 100 GHz are easily available today. In order to transform such a millimeter-wave MMIC into a fully-functional millimeter-wave system requires a package which has the following characteristics: first, it acts as an electrical interface between the MMIC and the end user. Second, it protects the MMIC against undesired environmental influences. Third, it provides the power supply required for operating the MMIC. Fourth, it dissipates the heat generated by the active components of the MMIC. Traditionally, split block package is used for such purpose due to its high performance and excellent reliability but for consumer applications such a package is bulky and costly. Instead a compact, light weight surface-mount technology (SMT) package is needed. The aim is to investigate the various SMT packages demonstrated in the recent years for frequencies close to or beyond 100 GHz. Investigate the advantages and disadvantages of each approach.

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