Abstracts

Monolithic Sampling Head IC

A. Miura, T. Yakihara, S. Uchida, S. Oka, S. Kobayashi, H. Kamada and M. Dobashi. "Monolithic Sampling Head IC." 1990 Transactions on Microwave Theory and Techniques 38.12 (Dec. 1990 [T-MTT] (1990 Symposium Issue)): 1980-1985.

A monolithic sampling head IC composed of a resonant tunneling diode (RTD) for the sampling pulse generator and Schottky barrier diodes for the sampling bridge has been developed. The RTD was made using an In/sub 053/Ga/sub 047/As/AlAs structure (pseudomorphic strained superlattice) and used as a sampling pulse generator. For this type of high switching voltage RTD, a peak to valley ratio (P/V ratio) of 9 at 202°C and peak to peak switching voltages of 1.5 V or more- at room temperature were achieved. The Schottky barrier diodes were made from an (In/sub 0.53/Ga/sub 0.47/As)/sub 0.5/(In/sub 0.52/Al/sub 0.48/As)/sub 0.5/ compound. A frequency bandwidth of at least 26 GHz was obtained. When attempting to use a quantum effect device such as an RTD in a practical application, the most important factor to consider is its reliability. We achieved good results in an endurance test of this device, in which it was made to continuously oscillate between 600 MHz and 1 GHz at 90°C for more than 1000 h.

❑ Return to main document.