Abstracts

A 4-Device Powercombiner Used as a Lossless High Power Switch at 94GHz

H. Barth. "A 4-Device Powercombiner Used as a Lossless High Power Switch at 94GHz." 1989 MTT-S International Microwave Symposium Digest 89.3 (1989 Vol. III [MWSYM]): 1087-1090.

In the millimeter wave range PIN-diode switches are rather lossy (ca. 2dB at 94 GHz). Additionally, the power handling capability of beam-lead diodes is limited to some 100 mW average power. To overcome switching problems in high power applications, i.g. for a pulse radar, the injection power for a symmetrical four coupler power combiner is switched from on of its two input ports to the other. Hence, the combined power alternately appears at one of the both output ports. If power and phase of the combined oscillators are balanced within .5dB and ±10°, the power level at the difference port is more than 25dB below the power level at the sum port. In this manner, the insertion loss of the lossy single port, double throw PIN-diode switch reduces only the low level injection power while the combined power of the four devices is switched lossless between the two output ports of the combiner network. In our application, this performance is used to switch the radar transmit power from left to right hand circular polarization.

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