

A Quasi-Optical Power Combiner with a Metallic Grating

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A Fabry-Perot resonator with a metallic grating is used as a circuit for coherent power combining of active devices (oscillators). Solid state devices such as Gunn diodes and FET's are mounted at grooves of the grating to form an oscillator array. The metallic grating is used to obtain impedance matching between the device and the circuit, and also acts as a heat-sink for the devices. The capability of heat sink is essential for high power active device arrays, because normal efficiency of FET's is less than 50% and that of Gunn diodes is at most 10%.

This paper describes an equivalent circuit for the resonator with Gunn diodes as well as the circuit for FET's.

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