Abstracts

Finite element realization of ultra-high quality factor frequency-temperature compensated sapphire-rutile whispering gallery mode resonators

M.E. Tobar, D. Cros, P. Blondy, J.G. Hartnett and P. Guillon. "Finite element realization of ultra-high quality factor frequency-temperature compensated sapphire-rutile whispering gallery mode resonators." 1999 MTT-S International Microwave Symposium Digest 99.3 (1999 Vol. III [MWSYM]): 1323-1326 vol.3.

To build the highest frequency stable microwave oscillators, high-Q sapphire dielectric resonators must have the temperature coefficient of permittivity annulled. This is achieved by fixing thin slabs of low loss crystalline rutile to the ends of the sapphire cylinder. Rigorous finite element analysis has been applied to this resonator. This has allowed optimization of the structure with respect to designability of the annulment temperature and the amount of spurious modes present.

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