Abstracts

An Application of the Parametron Amplifier to the X-Band ESR Spectrometer

I. Takao and T. Hayashi. "An Application of the Parametron Amplifier to the X-Band ESR Spectrometer." 1969 Transactions on Microwave Theory and Techniques 17.2 (Feb. 1969 [T-MTT]): 107-113.

An application of the parametron preamplifier (the phasecoherent degenerate parametric amplifier) to the X-band superheterodyne ESR (electron spin resonance) spectrometer to improve its sensitivity is described. The sensitivity and obtainable signal-to-noise ratio of the parametron ESR spectrometer are analyzed theoretically and the results confirmed experimentally. The improvement at the low bridge input power level up to 0.2 mW was about 6 dB which corresponds to the improvement of noise figure obtainable because of the inherent low-noise characteristics of the parametron amplifier. However, the improvement at power level of 20 mW amounted to 20 dB which is ascribed to the phase-sensitive amplification characteristics of the parametron preamplifier that reject the out-of-phase FM noise.

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