Abstracts

A Microwave Noncontact Identification Transponder Using Subharmonic Interrogation

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This paper presents the design and analysis of a novel microwave radio (RF/ID) transponder that has been developed for remote identification of personnel and articles, such as in "wireless key" entry systems. Based on a subharmonically pumped quasi-optical mixer, the transponder is activated by a C-band interrogation beam to upconvert and radiate a digitally modulated identification tone at two X-band frequencies. These response signals are nonharmonically related to the interrogation signal. The frequency conversion process is analyzed using a Volterra series model that includes the effects of self-bias current, coupled with a scattering metric that is directly useful in radio link calculations.

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