

Theory and measurement of backscattering from RFID tags

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Abstract

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Metrics

Abstract:

This paper presents a method for measuring signal backscattering from RFID tags, and for calculating a tag's radar cross section (RCS). We derive a theoretical formula for the RCS of an RFID tag with a minimum-scattering antenna. We describe an experimental measurement technique, which involves using a network analyzer connected to an anechoic chamber with and without the tag. The return loss measured in this way allows us to calculate the backscattered power and to find the tag's RCS. Measurements were performed using an RFID tag operating in the UHF band. To determine whether the tag was turned on, we used an RFID tag tester. The tag's RCS was also calculated theoretically, using electromagnetic simulation software. The theoretical results were found to be in good agreement with experimental data.

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