

Chipless radio frequency identification tag with high encoding capacity based on three coding levels

ABSTRACT

One of the key factors that provides the potential for chipless radiofrequency identification (RFID) tags as an excellent alternative to conventional barcode tags is the capacity of identities produced. This study proposes a design of chipless RFID tag with high bit capacity. Base-3 levels encoding, which consists of three encoding levels (0, 1, and 2), is employed. This new technique ensures the efficient use of each resonance frequency in the ultra-wide band (UWB) region, which entails a high encoding capacity compared with conventional base-2 levels encoding. The proposed tag comprises two coplanar wave guide (CPW) UWB monopole antennas with a CPW multiresonator that connects the antennas. The insertion loss of the multiresonator is investigated here in terms of magnitude and phase. The uniplanar propriety of the proposed tag makes this tag fully printable and low cost. Thus, the proposed technique is suitable for tagging low-cost items, such as paper documents.

Keyword: Radio frequency identification; Chipless tag; multiresonator; Base-3 levels encoding