A wideband reconfigurable folded planar dipole using MEMS and hybrid polymeric substrates

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A B S T R A C T

A wideband reconfigurable folded planar dipole using hybrid polymeric substrates is proposed. Artificial Magnetic Conductor (AMC) is a periodic structure composed of rectangular patches integrated with Jerusalem Cross (JSC) slots and being located in between two substrates. The Perfect Magnetic Conductor (PMC)-like behaviour of the AMC structure enabled the printed folded dipole to be placed near to the proposed structure, resulting in a low-profile antenna with 5.11 dB gain operating at 9.41 GHz. The combined use of the polymeric substrate and the proposed AMC resulted in a 1 GHz of bandwidth. The proposed antenna is capable in beam steering on the xz-plane via the integration of radio frequency (RF) MEMS switches placed on the antenna feeding transmission line. Simulations and measurements show a satisfactory agreement, with a beam steering capability at least 30° bandwidth of 1 GHz and maximum gain of 5.11 dB.

KEYWORDS:

Wideband; Hybrid polymeric; Reconfigurable; RF MEMS