Abstracts

Analysis and control of harmonic radiation from active integrated oscillator antennas

M.J. Cryan, G.R. Buesnel and P.S. Hall. "Analysis and control of harmonic radiation from active integrated oscillator antennas." 2002 Transactions on Microwave Theory and Techniques 50.11 (Nov. 2002 [T-MTT] (Mini-Special Issue on the 2002 IEEE Radio Frequency Integrated Circuit (RFIC) Symposium)): 2639-2646.

Harmonic radiation from microstrip patch oscillators is examined experimentally and theoretically using both a single and dual parallel-tuned circuit Van der Pol oscillator model. Closed-form expressions are obtained for the fundamental and first harmonic voltage amplitudes, and results show reasonably good agreement with a commercial circuit simulator. Such expressions will be useful for designers of active integrated antennas, giving them greater physical insight into their operation. Experimental results are presented for three configurations of a patch oscillator, i.e., rectangular patch, circular-sector patch, and quarter-wave shorted patch. The latter two configurations present very low resistance at the first harmonic frequency and this leads to improved harmonic suppression performance. This is in qualitative agreement with theoretical predictions.

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