

DEVELOPMENT AND CHARACTERIZATION OF SURFACE MICRO-MACHINED MEMS BASED VARACTOR

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Abstract- This paper presents complete behavioral analysis of a surface micro-machined MEMS varactor for frequency tuning application in voltage controlled oscillators in RF applications with high Quality factor and tunability. The dimensions of the MEMS device have been optimized with Finite Element Method based CoventorWare analysis and verified through lumped parameter analysis in Saber platform. The MEMS varactor has been fabricated with the PolyMUMPs process. The paper also describes the Mechanical and electrical characterization of the MEMS varactor to meet the designed specification.

Index terms: MEMS, varactor, VCO, capacitance tuning ratio, pull-in, SEM, vibration spectrum, LDV.