

“A low contact-resistance winged-bridge RF-MEMS series switch for wide-band applications”,
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Abstract – A MEMS ohmic series switch with a winged bridge has been designed, fabricated and tested. Based on the analysis of the various factors affecting the contact resistance of the switch, a new geometry has been adopted for the bridge, which involves the presence of two side wings and an appropriate number of bumps. An accurate electromagnetic analysis has been employed to identify a proper layout to reduce the losses due to bias lines and internal mismatch. In this manner, an on-state return loss better than 25 dB along with an off-state isolation better than 20 dB in the frequency range 0-30 GHz has been demonstrated. In reliability and power handling tests the switches have been actuated up to 108 cycles without any performance degradation and up to 109 cycles with an increase of 0.6 dB in the insertion loss (RF cold switching). Power handling tests have also been performed up to an input power of 5 W, showing a very linear P_{out}/P_{in} response and no stiction or failure due to other mechanisms of the MEMS switch.