

MOS VARACTORS WITH LARGE TUNING RANGE

ABSTRACT

A device including a substrate with a first well of a first polarity type is presented. The first well defines a varactor region and comprises a lower first well boundary. A second well is in the varactor region. It comprises a buried well of a second polarity type having an upper second well boundary disposed below an upper portion of the first well from an upper first well boundary to the upper second well boundary and a lower second well boundary disposed above the lower first well boundary. An interface of the second well and the upper portion of the first well forms a shallow PN junction. The varactor region includes a gate. The upper portion of the first well beneath the gate forms a channel region. In depletion mode, a depletion region under the gate in the channel region merges with a depletion region of the shallow PN junction.

Fig. 2