

High overtone acoustic resonator HBAR based on IDT's/c-tilted ZnO/Si for timing applications

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Abstract : In this paper, the frequency characteristics of high overtone bulk acoustic modes, generated by interdigital transducers (IDT's) on c-tilted ZnO/Si, are theoretically and experimentally investigated. The origin and characteristics of high overtone acoustic modes in ZnO piezoelectric layer on silicon substrate are discussed and one port HBAR resonator, based on c-axis tilted ZnO/Si, is fabricated and tested by network analyzer. The results achieved in this work are of interest in design and fabrication of radiofrequency sources and electronic timing devices based on thin film technology.

Keywords : High overtone bulk acoustic modes, HBAR resonator, piezoelectric thin film, c-tilted ZnO, Frequency characteristics