Advanced TC-SAW Filter Technology for 5G Wireless Systems (Invited Presentation)

[Author(s)]
K. C. Wagner, M. Honal, I. Bleyl, C. Eggs, M. Pernpeintner, A. Bergmann
RF360 Europe GmbH, Munich, Germany

Temperature compensated SAW technology, based on a $LiNbO_3/SiO_2$ layered structure combined with high density metal electrodes is widely used to realize high performance surface acoustic wave (SAW) components. In many application areas, this technology has substituted former conventional SAW based on $LiTaO_3$ crystal substrates totally. Over time, sophisticated methods have been developed to (i) suppress transversal modes, (ii) cancel or control spurious bound and unbound acoustic modes of different polarization than the main mode, (iii) maximize the Bode quality factor.

Recently, at the transition between 4G and 5G system deployment, TC-SAW technology evolved again, in order to provide the required (i) improvement of high power signal compression and power durability, respectively time-to-failure, (ii) large resonator pole-zero distances for high relative filter bandwidths of newly defined RF bands, (iii) optimized amplitude and group delay ripple performance.

This talk will review recent technological, material-related, simulation- and design-related changes and give examples of filters with very low temperature coefficient of frequency (TCF) (< 5ppm/K@1800MHz) and of components with rel. filter bandwidths > 5%, e.g. for 600 MHz band (Bd. 71; to be refarmed for 5G).