

Elektrotechnik-Elektronik-Informationstechnik

EEI KOLLOQUIUM

Physical background of non-linearity in RF MEMS acoustic devices

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Zoom-Meeting:

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Diskussionsleitung: Prof. Dr.-Ing. Georg Fischer

The rapid proliferation of smart-phones, tablets and intelligent wearable is one of the most important reasons driving the success of high performance RF MEMS acoustic wave devices globally. The development of new wireless standards such as 5G and support for already existing 4G frequency bands is increasing the complexity of the RF modules. Therefore, the specifications related to key parameters such as non-linearity, power durability and reconfigurability are very difficult to fulfill. The specifications regarding the non-linear behavior of the filters at ambient temperature and at high power levels are even more stringent, since the harmonics and inter-modulation terms generated result in interference into other bands, which are difficult to separate from the wanted signal.

This talk discusses about the undesired nonlinear effects such as harmonics and intermodulation distortions (IMD) in acoustic devices. These nonlinear effects are generally caused by the intrinsic nonlinear material properties, geometrical and interface non-linearity. Therefore, it is necessary to build a comprehensive nonlinear model to predict such effects in acoustic devices.

This can help in finding an efficient way to reduce the non-linearities and also to accelerate the performance of acoustic filter devices in the case of carrier aggregation (CA) and at high power levels.