Abstracts

Spurious suppression technique for edge-trap-type SAW resonators and their application to 1-GHz wide-band SAW-VCOs for mobile communications

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1-GHz wide-band VCOs using SAW resonators have been successfully developed. A control-voltage sensitivity of over 5%/V has been achieved by using new edge-trap-type SAW-resonators. Optimizing the reflectors of SAW resonators is very effective for suppressing the spurious resonance of the Rayleigh wave in the oscillation band. Two types of VCOs are compared. One uses a Si bipolar junction transistor as a feedback amplifier and the other uses a GaAs MESFET. Both VCOs achieved a control-voltage sensitivity of over 5%/V and a phase noise of less than -107 dBc/Hz at a 25 kHz offset frequency from the carrier frequency. The GaAs MESFET VCO showed better phase noise performance than the Si transistor VCO at a 30-kHz or greater offset frequency. By changing the amplifier elements, it is possible to achieve the requirements for both local VCOs and transmission VCOs for wireless communication terminals.

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