Negative Radio Components

Novikov, Oleg

In the main, basic characteristics of radio components such as resistance R, capacitance C and inductance L are positive. Consequently, the combinations of these components that have time values, for example RC, L/R, LC, are also positive. Main processes in electric chains depend on these constants, so the idea of inventing “negative components” makes a possibility to change their sign and, as a result, cardinally change the basic features of the process flowing. Damping or excitation of oscillations, direction and frequency of spreading signals in media could be the examples of such features. Having been engaged by this idea I invented negative radio components: resistor, capacitor and inductor, which differ from positive ones by negative values of R, C and L in appropriate formulas, linking a current passing through each component and a voltage at it (or their derivatives). The developed constructions of the components consist of the operational amplifier (op-amp) with negative feedback and only resistors and capacitors. Final rating value of the components is determined by used resistors and capacitors, and therefore it becomes easy to obtain requiring rating value very exactly by choosing them. Another advantage of using these components is wide range of operative frequencies (resistor: up to ~1.5 MHz; capacitor: up to ~1.5 MHz; inductor: from ~10 Hz to ~1.5 MHz). Also I showed the dependence between operating restrictions and the supply of the op-amps and constituted components. To check its operability in systems, I applied them to some important circuits and compared received experimental behavior with my theory. Some circuits demonstrated rather interesting behavior because of obtained negative constants.

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