Tunable RF components enable smaller, thinner smartphones with reliable antenna performance

ON Semiconductor has introduced a new family of Tunable RF Components (TRFC) that address the design challenges faced by engineers developing the latest generation smartphones. The new devices optimally combine tuning range, RF quality factor (Q) and frequency operation, providing a superior solution to existing fixed approaches.

End-user demand for smaller, thinner handsets challenges designers to reduce antenna volume without impacting performance. At the same time, the rapid increase in demand for mobile data means that carriers worldwide are increasing the number of bands that a smartphone must cover. ON Semiconductor's new TCP-30xx family of low insertion loss Passive Tunable Integrated Circuits (PTICs) [1] and TCC-103 PTIC Controller IC [2] allow performance to be tuned and optimized to counter lower antenna volume and increased frequency coverage requirements. They also help overcome head- and hand-effect problems.

With a 4:1 tuning range and capacitance values from 1.2 picofarad (pF) to 8.2 pF, the TCP-30xx PTIC series is offered in WLCSP and QFN package styles and can be used to replace traditional "fixed-match" devices. ON Semiconductor's PTICs also allow for a more efficient use of the smartphone's power amplifier to reduce the current drain and help extend handset battery life. A three-times improvement in data rates in marginal coverage areas can be achieved with a significant reduction in dropped or missed calls.

Designed to work in conjunction with the company's PTICs, a new PTIC Control IC is also available. The TCC-103 is a high-voltage digital-to-analog IC that provides control and bias in a tunable solution and is fully compliant with the timing needs of cellular and other wireless system requirements. The low-power IC features an integrated boost converter with three programmable outputs (up to 24 V) and an interface that allows independent control of multiple tuning elements from a single MIPI/SPI bus element. It is housed in a WLCSP package for stand-alone or module integration.

ON Semiconductor's proven expertise and technology in TRFCs are underlined by over 10 million units shipped to-date, a worldwide field application team to support customer designs, and design tools that help speed and simplify the optimization of antenna circuits.

Packaging and pricing
The PTICs are offered in WLCSP and QFN packages and are priced at $0.50 (USD) in quantities greater than 250,000 units.

For more information, visit http://www.onsemi.com. [3]

Source URL (retrieved on *05/05/2015 - 9:29pm*):
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[1] https://www.onsemi.com/PowerSolutions/parametrics.do?id=101880
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