

## Products & Technologies



Front-end modules

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## Advanced multiplexers for UMTS

EPCOS has developed several new multimode and multiband front-end modules that allow future mobile phones to use the different frequency bands of UMTS. Depending on the number of bandwidths used in a particular UMTS phone, several duplexers are needed because UMTS transmit and receive simultaneously.

EPCOS is the only manufacturer that has all the necessary technologies to produce the needed components for all UMTS standards. Already the first duplexers for single-band UMTS have entered volume production. The duplexers measure just 3 x 2.5 x 1.2 mm<sup>3</sup> and 2 x 2.5 x 0.6 mm<sup>3</sup>.

These duplexers are usually integrated in subsystems and modules. This is the only way to meet the requirements for further miniaturization and low losses. EPCOS uses LTCC (low-temperature co-fired ceramic) technology as integration platform, in which the necessary passive component functions are embedded in a multilayer ceramic.

This technology also allows mode switches to be integrated where required. It results in products such as dual duplexers, quintplexers with additional navigation capability thanks to GPS, triplexers with a I+IV band combination and front-end modules with integrated duplexers (FEMiD) for the I+II+IV+VIII bands. The new solutions from EPCOS can not only be accommodated on minimized areas but also allow ultra-flat telephones to be implemented thanks to their low insertion height of no more than 1.2 mm.