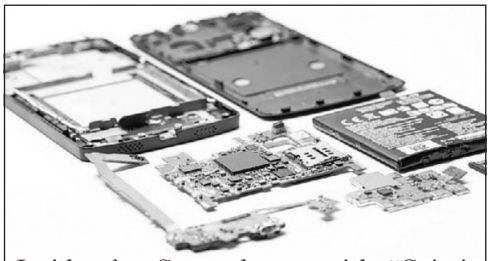
Editorial

Simultaneous Multichannel Radio Connection

Chip technology: The changeover to 5G demands semiconductor technique. It must be prepared with more and more higher frequencies. No network when Smartphone owner carried out public sale, his apparatus does not have straight connection to a base station. It happens also with auto radio when the installed transmitter as for example in a tunnel is not receivable. However, other than radio which intercept listen a frequency, the mobile telephone here are more flexible. These listen and broadcast simultaneously in many differing frequency ranges the so-called bands.

The French market research firm Yole Development investigated how the number of bands which supports technically an iPhone radio, has increased over the years. In 2007 it was still less than 5, this number in 2016 rose to around 40, out of these 25 alone in up-to-date mobile telephone standard LTF. Nevertheless also the preceding standards upto GSM a Smartphone must control.



Inside of a Smartphone : with 5G it is still smaller, therefore many functions are brought in on a chip.

With this the complexity of the hardware grows in the instrument. The researcher Nadine Collaert at the Belgium Electronic research centre IMEC knows this. This will still rise with the change in next generation 5G, specially then the frequency ranges over 26 GHz (so-called Millender waves) will take place are attracted. Concrete statement will take place here certainly first through the World Radio Conference in 2019. However collaert and her colleagues prepare themselves with pertinent chip manufacturers today. Previously these remained for the mobile phone used frequency bands under 6 GHz. For the first 5G implementation there are rather frequencies under 1 GHz which definitely show smaller bandwidths. For that, however, there should have higher ranges than the higher frequencies. For this frequency zone, there is plurality of providers corresponding radio modules, consisting of various components such as power amplifier, filter and more. All these investigate the binding string between most possible higher transmission efficiency, good receiving quality and small energy consumption.

The Problem: According to Collaert, the efficiency and exit performance, as for example of power amplifiers with rising frequency sink. The so popular silicon-cosmos-technology is here put under other techniques with the chip manufacturers. With very high frequencies the connecting semiconductor from elements of third and fourth groups of periodic system to the materials of choice. Typical substitutes are gallium arsenide (GaAs) or indium phosphate (InP). Additionally the researchers still take into consideration a material, which previously before all in the power electronic finds application i.e. gallium nitride (GaN).

In a research programme the industries 'Imec' at present investigate, how the "expectation list" of chip technology for a 5G future in millimeter wavelength zone can be transposed. More performance as silicon offers today, higher frequency as Cmos performs today, however with that a most possible higher compatibility to established processes in the chip industries. Then lastly the chip technologists want the new radio components with classical Cmos circuit arrangement (control radio hook up) on a chip integrate and therefore from antenna connection up to the mode have only one unique radio chip in Smartphone.

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