

General information about SAW components

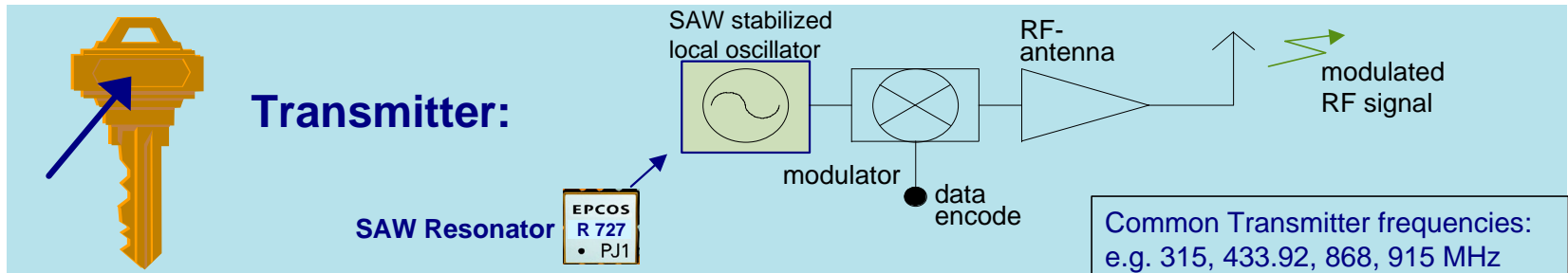
Surface Acoustic Wave (SAW) resonators and front end filters are key components in modern Remote Control Applications, which transmit in Europe typically at 433.92 MHz or 868-870 MHz and in the USA at 315 or 915 MHz. These remote controls are used in systems for Remote Keyless Entry (RKE, wireless operation of a car's central locking system), wireless Tire Pressure Monitoring (TPMS), electronic toll, RFID, short range data transmission, security alarms and garage door openers. They consist of several transmitters and receivers as well as the combination of both, transceivers.

For further information, latest updates, datasheets, s-parameters, application notes and other technical support documents, please visit our homepage:

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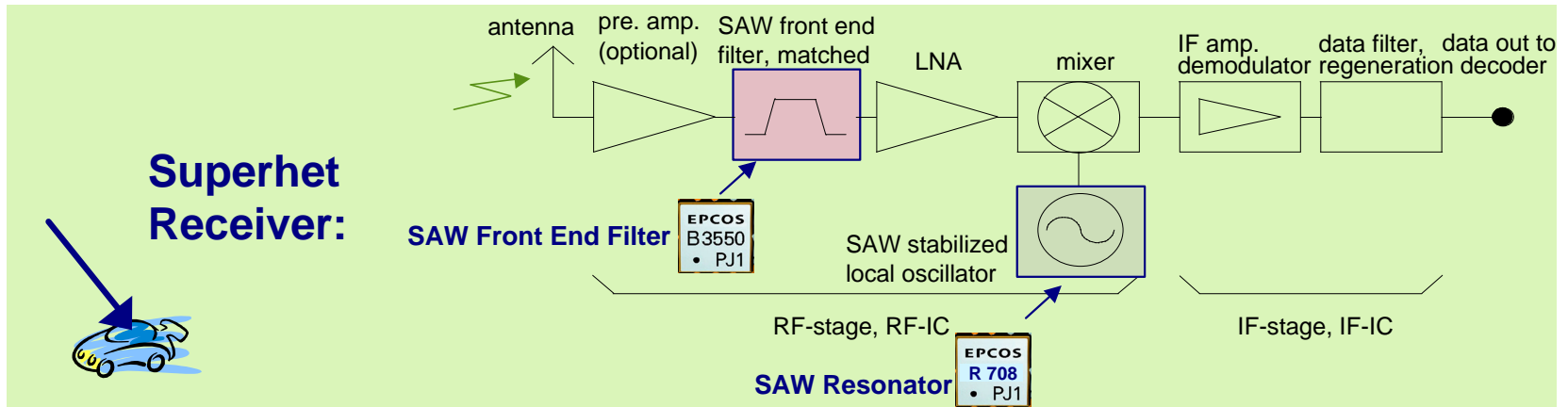
Architecture of a SAW Resonator stabilized Remote Control Transmitter



The code which is supposed to be transmitted to the receiver consists of an encoded identifier (including a rolling code for security reasons) and the message itself to e.g. unlock the central locking system of a car.

An oscillator which is synchronized by a SAW resonator oscillates at an exact frequency. Thereby, it generates an RF carrier signal, which (using the simple on-off-keying procedure, OOK) is modulated according to the transmission code by simply turning the oscillator on and off. This coded, modulated RF signal will be sent out through the antenna of the transmitter.

Architecture of a SAW Resonator stabilized Remote Control Receiver with SAW Frontend Filter



The modulated RF signal (encoded message) sent from the transmitter is received by the antenna of the receiver a few feet away (typically 30-300 ft.). Additionally, the receiver will involuntarily pick up environmental noise and spurious emissions which may jam/block the receiver, making it deaf for any message from the transmitter. To avoid this, a narrow band SAW front end filter with high selectivity can filter out this unwanted noise.

A local oscillator (stabilized e.g. by a SAW resonator like the transmitter oscillator) generates an LO frequency, typically 500 kHz or 10.7 MHz below transmission frequency. The filtered RF signal from the antenna will now be mixed down in a mixer with this LO frequency to an intermediate frequency (IF), which can be decoded by decoder ICs and microcontrollers.