



## TUNING FORK SERIES CM315 FROM CITIZEN FINEDEVICE



Due to the ongoing miniaturization of electronic devices, manufacturers of passive and active components strive to reduce their component design. This applies also to clock crystals which are widely used in application as home automation, Metering or mobile phone which requiring a precise timing frequency. The time reference is provided often by tuning fork quartzes. Based on the 32.768 kHz, the one-second interval is generated by dividing the frequency.

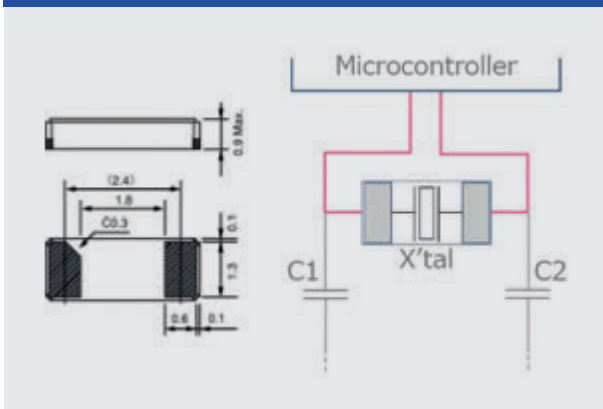
The effect of the miniaturization of conventional quartz is often underestimated. Reducing the size means in most cases also reduction of the inner quartz blank. This usually causes an increase of the ESR value (Equivalent Series Resistance). But precisely this resistance should be as low as possible in order to ensure a high "Q"-value and reliable start of oscillation. In addition take into account that a higher ESR will increase the power consumption. Because in order to maintain the quartz oscillating it is necessary to permanently supply the crystal with energy and the higher ESR cause bigger losses. Since the frequency of the processors increases as well over last time, keep in mind that effects of EMI became more important in quartz design

Fortunately Citizen FineDevice offer different solution in a very small 3.2 x 1.5mm package for the challenges of an oscillator design. The standard Type CM315D offer a ESR of 70 kOhm. With the Type CM315DL the Citizen engineers succeeded despite concomitant miniaturization to guarantee an ESR value of 50 ohms. An improvement of approximately 30% compared to the usual ESR of 70 kOhm for a 3.2 x 1.5 mm tuning fork design. This tuning fork is therefore perfectly suited in application using battery power supply as „low power micro computer“ applications.

Further more Citizen released a Type, the CM315E series. To interconnection terminals are realised on one side of the crystal package. This provides new variations in the design of the circuit board and even more important allow especially to Reduce trace lengths to the processor input s much as possible This improve the EMI performance. A Crystal units with excellent Freq stability and hard to receive the effect of noise. Recommended for noise sensitive Applications. This CM315E version it will be launched soon as well in the low ESR version (CM315EL).

The crystals are manufactured with most common load capacitance of 12.5 pF. 9.0 pF, 7.0 pF 6.0 pF are also feasible.

CM315D – 3.2 x 1.5 mm, 2 pads



CM315E – 3.2 x 1.5 mm, 3 pads

