Application Note

DS1, 2000-10-05

Use of external Crystals

C165UTAH/C165H/C161U

V 1.3

The devices C165UTAH, C165H and C161U share a powerful clock generation concept including an integrated oscillator, which differs from other Infineon C16x devices in some details. As usual, the implemented oscillator can either run with an external crystal and the appropriate oscillator circuitry or can be driven by an external clock source.

Due the to comparatively high maximum operating speed of 36MHz, design- and testing-restrictions the designer of a system has to meet special requirements on the frequency deviation of the crystal to achieve the highest possible performance.

The internal and external bus timing and therefore the proper operation at an internal clock frequency of 36 MHz can only be guaranteed for crystals with an accuracy better than 96ppm!

Please note also, that the implemented oscillator cell is designed as a “low swing crystal oscillator” which clearly lowers the signal amplitude in comparison to the conventional oscillators. The reduction of the operating voltage lowers the currents through the crystal and therefore EMI problems. Furthermore the power dissipation of the crystal is reduced, improving ageing and reliability aspects, the phase jitter behaviour and oscillation stability.

The implemented “low swing crystal oscillator” has a signal amplitude of only about 1 V peak-to-peak!

More information about the oscillator circuitry can be found in the application note “Crystal Oscillator of C165UTAH/H and C161U“.

Revision History: Previous Version:

Major Changes: