VS10XX AppNote: Using ceramic resonator with VS10xx

Description

This document describes how to use a ceramic resonator to replace crystal in VS10XX applications. It shows an example schematic and gives short info on dirrefencies between crystal oscillators and ceramic resonators.

This document applies to VS1011, VS1002, VS1003, VS1023 and VS1033.

Revision History

Rev	Date	Author	Description
1.00	2006-02-27	PLe	Initial revision.
1.01	2006-03-22	PLe	Minor corrections.

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1   General

A ceramic resonator is a robust and inexpensive way to provide clock to VS10XX applications.   Compared to a quartz crystal, a resonator can tolerate relatively hard physical abuse. Ceramic resonators are small and inexpensive but are not as accurate as quartz crystal. In VS10XX applications the accuracy of a resonator is usually more than good enough.

A three legged resonator with internal capasitors should be used.

VS10XX devices commonly use a 12.288MHz oscillator. Ceremic resonators may not be available in this frequency. Frequency between 12MHz and 13MHz is recommended. CLOCKF-register must be set correctly to the frequency used. Notice that using slower than 12.288MHz oscillator may cause problems when decoding the highest bitrate files. Also notice that the highest samplerate to play at correct speed is (Osc. freq.)/256. These limitations also apply to crystal osclillators.
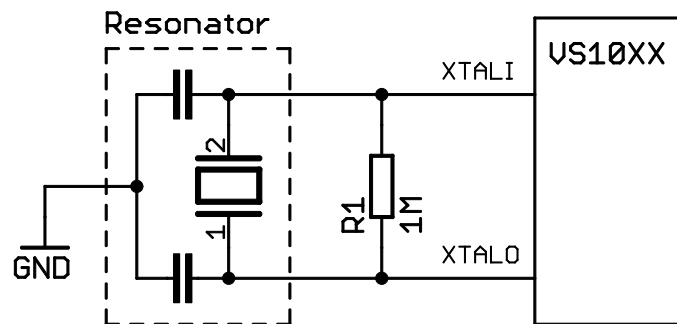
2   Recommended connection

Figure 1: A ceramic resonator as VS10XX clock

Figure 1 shows the recommended way of connecting a resonator to a VS10XX device.   The components inside the dashed line are located insed the resonator package.   R1 is mandatory resistor that provides proper bias for the oscillator input.

Resonator and R1 should be connected as close to VS10XX chip as possible. A ground plane should be used for best performance.

3 Document Version Changes

This chapter describes the most important changes to this document.

Version 1.01, 2006-03-22

- Minor corrections.

Version 1.00, 2006-02-27

- Initial version.

4   Contact Information

VLSI Solution Oy
Hermiankatu 6-8 C
FIN-33720 Tampere
FINLAND

Fax: +358-3-316 5220
Phone: +358-3-316 5230
Email: mp3@vlsi.fi
URL: http://www.vlsi.fi/

Note: If you have questions, first see
http://www.vlsi.fi/vs1001/faq/
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