VS1063 to VS1073 Migration Guide

Description

This document describes how to migrate from VS1063 to VS1073. It lists hardware and software differences and other considerations.

This document applies to all versions of VS1063 and VS1073.

Revision History			
Rev	**Date**	**Author**	**Description**
1.15	2025-04-03	HH	Initial release.

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1 General

With the one exception mentioned below, VS1073 is pin-compatible with VS1063.

Major updates in VS1073 are:

- Core voltage for CVDD0. . . CVDD3 has changed from 1.85 V to 1.25 V.
- Encoders:
  - Added FLAC encoding.
- Added SCI Multiple Read mode to be able to read encoded data without 100 % overhead.
- Decoders:
  - Added ALAC, APE, DSD, AIFF, Opus decoding up to 2 channels
  - Added AC-3 decoding, downmixed to stereo.
- The highest allowed internal clock speed for VS1063 was 67.6 MHz. VS1073 can run at up to 98.304 MHz (number based on engineering samples and subject to change; see *VS1073 Datasheet* for current information).
- SCI registers SCI_HDAT0, SCI_HDAT1, and SCI_CLOCKF changed.
- Removed proportional and fixed-width font in data ROM for standalone applications.
- The I2S output is now capable of 16-bit audio up to 192 kHz, or 32 bits up to 96 kHz.
- Analog drivers are not powered up automatically if no audio is played.

Some of these new features have required for the register interface to be changed accordingly.

2 Hardware

With the exception of the lowered core voltage CVDD, VS1063 and VS1073 are pin compatible, so there are no other needs to update PCBs for VS1073.

3 Application Considerations

This chapter gives general info on applications using VS1073.

3.1 Hardware Design

From a hardware point of view, and with the exception of the core voltage, VS1073 is a drop-in replacement for the VS1063.

3.2 Software Considerations

Basic operation of VS1063 and VS1073 is similar: playing back audio files doesn't usually require many changes to the controller software, except for replacing loading of the *VS1063b Patches w/ FLAC Decoder* package with the *VS1073 Patches* package, available at `http://www.vlsi.fi/en/support/software/vs10xxpatches.html`
Using the *VS1073 Patches* package is highly recommended.

Major changes to microcontroller software is only needed when the features new to the VS1073 are required, or if audio encoding is used. If audio encoding is used, the new SCI Multiple Read mode makes it twice as fast to read high-bitrate data as before. Read Chapter *SCI Multiple Read* of the *VS1073 Datasheet* for details.

Note: Applications running on VS1063 will not run on VS1073 without porting them first.

4 SCI Registers

VS1063 and VS1073 have a few differencies in registers. The following chapters list these differencies. See more info from VS1063 and VS1073 datasheets.

4.1 Changed: SCI_MODE

A new register bit SM_SCIMULTIREAD (12) activates the option for SCI Multiple Read operations. With this operation, the same SCI register can be read multiple times, making it twice as fast to read high-bitrate encoded audio data (e.g. PCM or FLAC).

4.2 Changed: SCI_STATUS

SS_VER is 6 for VS1063, and 8 for VS1073.

4.3 Changed: SCI_HDAT0 and SCI_HDAT1

When decoding MP3 files, SCI registers SCI_HDAT0 and SCI_HDAT1 used to show the 32 bits of the MP3 header, and for other files they would show other, relevant information to the files. In VS1073, the contents of these registers is unified between all audio formats.

4.4 Changed: SCI_CLOCKF

The values for setting up SCI_CLOCKF have changed. Changing the format was necessary because the old format was insufficient for setting the new, higher clock frequencies that VS1073 can handle.

5 Sine Tests

SDI-bus activated Sine Test has been removed. New, more versatile sine and sweep tests may be activated through the SCI bus. Read Chapter *Sine and Sweep Tests* of the *VS1073 Datasheet* for details.

6 User Applications

Because memory addresses have changed, the user applications, plugins and patches are different between VS1063 and VS1073.

The new SCI Multiple Read functionality removes the 100 % overhead that was an earlier inconvenience with reading high-bitrate data.

7 Analog Wake-Up

Unlike VS10XX audio ICs up to VS1063, VS1073 does not wake up its analog drivers automatically after power-up. It will wake them up only after audio has been decoded for a while. If the user wants to turn up the analog drivers manually, then turn SCI_STATUS register bit SS_APDOWN2 (bit 3) off after waiting for a short while after reset. If you turn SS_APDOWN2 on too quick after a reset, you may hear a small, single click.

8 Licenses

If the end product plays formats that require licenses, refer to the *Licenses* chapter of the VS1073 Datasheet. To the best knowledge of VLSI Solution, patents related to MP3 have expired years ago and do not require licenses anymore.

9 Microcontroller Examples

Examples on how to control VS1073 using a microcontroller are available at
http://www.vlsi.fi/en/support/software/microcontrollersoftware.html

10 Latest Document Version Changes

This chapter describes the most important changes to this document.

Version 1.15, 2025-04-03

- Initial release, using VS1053 to VS1063 Migration Guide as a basis.

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