

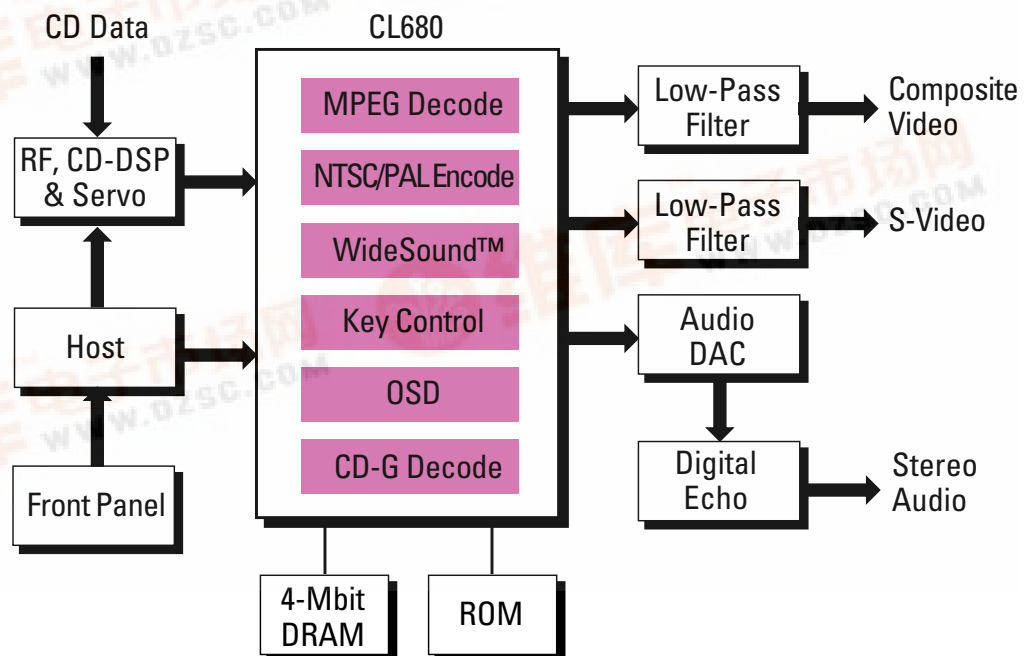
# CL680 VIDEO-CD DECODER

## SINGLE-CHIP AUDIO/VIDEO/CD-ROM DECODER WITH INTEGRATED NTSC/PAL ENCODER

The CL680 VideoCD Decoder is a highly integrated MPEG-1 system decoder for VideoCD players.

- **Higher Integration:** The CL680 has an integrated digital NTSC/PAL encoder, eliminating the need for a discrete device and reducing total design footprint. Stereo key control and vocal fade features replace additional audio circuitry in Karaoke applications. No other single-chip decoder on the market can match the CL680's level of integration.
- **Enhanced Quality:** The CL680 incorporates WideSound™, C-Cube's proprietary audio technology that provides a surround sound experience in stereo applications. Also, the OSD feature has been enhanced to display more on-screen characters.
- **Greater Reliability:** C-Cube's ClearView™ technology, introduced on the CL484, has been further enhanced in the CL680. VideoCD players based on the CL680 play more types of media and have fewer visible flaws than ever.

The CL680's microcoded architecture enables OEMs to retain their engineering investment in hardware and system software from their CL484 designs. CL680-based designs can be upgraded to add new features as the CL680 product line evolves without changing the hardware design.



## AUDIO FEATURES

The CL680 VideoCD Decoder integrates audio features to provide increased functionality and value to consumers without increased system cost.

### WIDESOUND™

C-Cube's audio algorithms use advanced DSP techniques to expand the perceived sound field with standard stereo sound tracks.



### KEY CONTROL

Key control is a standard feature in most Karaoke products. The CL680 changes the pitch of the mono or stereo audio track in single quartertone increments, eliminating the need for a separate DSP for Karaoke.

### VOCAL FADE

By comparing the left and right channels, the CL680 attenuates the vocal component of a stereo program. This feature allows VideoCDs and standard CD-DA recordings to be used for Karaoke and accommodates non-standard video Karaoke titles.

## VIDEO FEATURES

In addition to its extensive audio processing capabilities and features, the CL680 offers unique video features that provide consumers added utility compared to a standard VideoCD player.

### CLEARVIEW™

The result of over 20 man-years of engineering effort, ClearView sets the standard for reliable, clear video. C-Cube's ClearView technology, first introduced on the CL484, has been further enhanced on the CL680. These enhancements include:

**ERROR HANDLING TECHNOLOGY:** Errors that the CD-DSP can detect but not correct can be corrected by ClearView. These errors include both header and picture (data) errors. ClearView identifies the error type, classifies it, and uses the best possible strategy for error concealment.

**COMPATIBILITY:** ClearView ensures complete compliance with the entire MPEG-1 standard, so that the CL680 can flawlessly play back VideoCDs that have been encoded in a variety of styles. ClearView plays back most VideoCD formats, including VideoCD 1.1 and 2.0, KaraokeCD, OM-1 and CD-I.



### DISCVIEW™

This feature provides Playback Control (PBC) capability with VideoCD 1.1 discs by displaying up to nine images on the TV screen to form a video menu. The CL680 can read images from each track on a single disc or from multiple discs to provide a playback control menu, or images can be from a single track to provide chapter access menus.

### FLEXVIEW™

The CL680's FlexView feature converts NTSC source material to PAL format to provide full-screen, correctly proportioned displayed video. FlexView uses C-Cube's adaptive interpolation technology for smooth, raster-free scaling.

It also converts coded frame rates of 24 (film), 25 (PAL) or 30 (NTSC) Hz to NTSC or PAL display rates (60 or 50 Hz).

## Zoom

The CL680 incorporates hardware to enable stills or motion pictures to be magnified in a selected area of the screen.



## Graphics Features

The CL680 incorporates an advanced graphics engine that allows VideoCD player designers to display player status on the television screen and to support graphic enhanced CD formats such as CD-G.

### On-Screen Display (OSD)

The CL680 provides the ability to display user-defined graphics (stored in ROM) over real-time video. The CL680 allows graphics to be displayed anywhere on the TV screen, and it supports both run-length compressed and bitmap images. To ease the development of OSD characters, C-Cube provides a font-conversion



utility, which allows designers to easily run-length encode any bitmap font for storage in the CL680's ROM.

### CD-G Support

The CL680 provides on-chip support for the CD-G (CD audio plus graphics) format extension to the Red Book (Compact Disc Digital Audio) standard.

## Integration Features

The CL680 family is designed to reduce system cost by incorporating more VideoCD functions and providing glueless interfaces to other system elements.

### Integrated Digital NTSC/PAL Encoder

The CL680 includes a digital NTSC/PAL encoder with S-Video (Y/C) and composite outputs (9-bit resolution) and excellent signal separation for a superior picture.

### Improved DRAM Usage

The CL680 supports PAL and NTSC including high-resolution stills with only 4 Mbits of 70-ns DRAM. More efficient use of DRAM provides twice as much DRAM space to store user-defined OSD.

### Intelligent Interface Design

The CL680 provides glueless interfaces to the CD-DSP, DRAM, ROM, and audio DACs. Support for all VideoCD and MPEG standards (including Video CD 2.0 and 1.1, Karaoke CD 1.0 and CD-I Green Book) means that no external parsing is required.

## Packaging

The CL680 requires a design-friendly three-volt supply and consumes less than one watt during decoding. In addition, it automatically reduces power consumption when decoding CD-DA. The CL680 can accept 5-volt inputs.

Like the CL48x family, the CL680 is packaged in a 128-pin small-outline PQFP (18mm x 18mm body size).



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