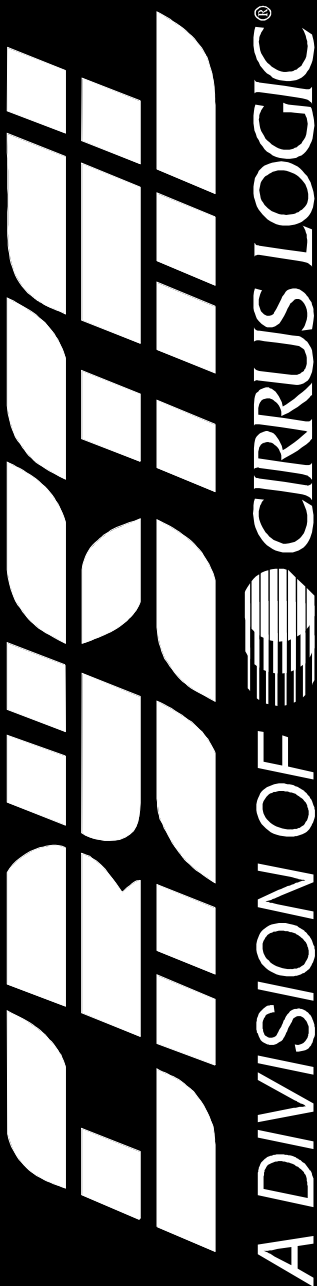




CS4952

NTSC/PAL Digital Video Encoder

The following information is based on the technical datasheet:

CS4952 DS223PP2 OCT '97

Please contact Cirrus Logic : Crystal Semiconductor Products Division for further information.

CRYSTAL SEMICONDUCTOR PRODUCTS DIVISION PRODUCT INFORMATION

Copyright © Cirrus Logic, Inc. 1998
(All Rights Reserved)

PI223PP1 JAN '98

NTSC/PAL Digital Video Encoder

Features

- Simultaneous composite and S-video output
- Supports RS170A and CCIR601 composite output timing
- Multi-standard support for NTSC-M, PAL (B, D, G, H, I, M, N, Combination N)
- Optional progressive scan @ MPEG2 field rates
- CCIR656 input mode supporting EAV/SAV codes and CCIR601 Master/Slave input modes
- Stable color subcarrier for MPEG2 systems
- NTSC closed caption encoder with interrupt
- Supports Macrovision copy protection in CS4953 version
- Host interface configurable for parallel or I²C compatible operation
- General purpose input and output pins
- Individual DAC power-down capability
- On-chip voltage reference generator
- On-chip color bar generator
- +5 volt only, CMOS, low power modes, tri-state DACs

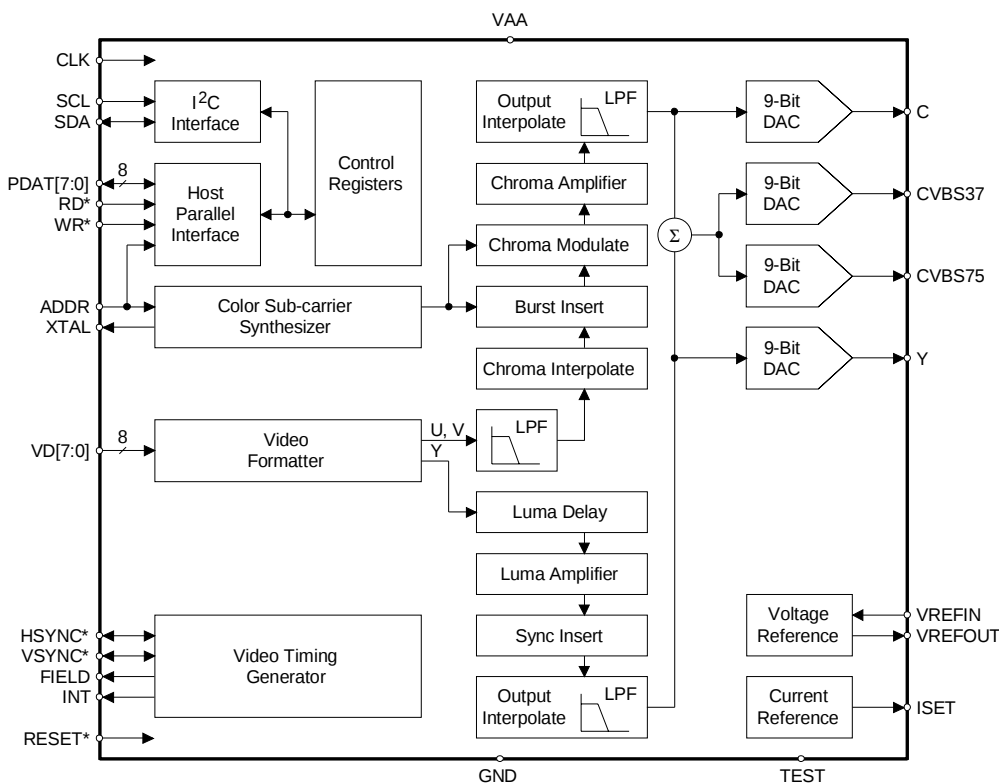
Description

The CS4952/3 provides full conversion from YCbCr or YUV digital video formats into NTSC & PAL Composite and Y/C (S-video) analog video. Input formats can be 27 MHz 8-bit YUV, 8-bit YCbCr, or CCIR656 with support for

EAV/SAV codes. Output video can be formatted to be compatible with NTSC-M, or PAL B,D,G,H,I,M,N, and Combination N systems. Also supported is NTSC line 21 and line 284 closed captioning encoding.

Four 9-bit DACs provide two channels for an S-Video output port and two composite video outputs. 2x oversampling reduces the output filter requirements and guarantees no DAC related modulation components within the specified bandwidth of any of the supported video standards.

Parallel or high speed I²C compatible control interfaces are provided for flexibility in system design. The parallel interface doubles as a general purpose I/O port when the CS4952/3 is in I²C mode to help conserve valuable board area.



Overview

The CS4952/3 is a complete multi-standard digital video encoder implemented in current 5-volt only CMOS technology. CCIR601 or CCIR656 compliant digital video input can be converted into NTSC-M, PAL B, PAL D, PAL G, PAL H, PAL I, PAL M, PAL N, or PAL N Argentina-compatible analog video. The CS4952/3 is designed to connect to MPEG1 and MPEG2 digital video decompressors without glue logic.

Two 9-bit DAC outputs provide high quality S-Video analog output while two other 9-bit DACs simultaneously generate composite analog video. The CS4952/3 will accept 8-bit YCbCr or 8-bit YUV input data.

The CS4952/3 is completely configured and controlled via an 8-bit host interface port or an I²C compatible serial interface. This host port provides access and control of all CS4952/3 options and features like closed caption insertion, interrupts, etc.

In order to lower the end user set-top overall system costs, the CS4952/3 provides an internal voltage reference which eliminates the requirement for an external discrete 3-pin voltage reference.

FAQs

- 1) How to bring the CS4952 in standby mode?
A: In order to bring the part in standby mode, you have to power down all the DACs (through register settings) and then turn off the clock.
The total current consumption is then 2 mA, which gives a total power consumption of 10 mW.
The CS4952 retains its previous configuration. It does not need to be reprogrammed.
- 2) What is the difference between powering down DACs and disabling DACs?
A: When the DACs are disabled, there is no current flow from the output, but there is still a current flow through the DAC. For a low power operation, the DACs can be shut down via the power down registers. In this mode, turn-on through the control register will not be instantaneous.

- 3) How to get the best performance out of the CS4952?
- A: Three points should be considered to achieve the best performance possible: Layout, clock, ISET.

Proper mixed-signal layout techniques should be used, such as, short supply traces, low ESR decoupling capacities, and split analog and digital power and ground.

Care should be taken to have the best possible 27 MHz clock. It should be free of jitter as much as possible, because color burst accuracy and stability are limited by the 27 MHz clock.

The ISET resistor determines the DAC output current per bit. The selection of that resistor is important to get good DAC performance. It should not vary over temperature and should be precise. Typically a metal film resistor with 1% accuracy should be used.

Ordering Information

CS4952/3-CL	44 pin PLCC
CS4952/3-CQ	44 pin TQFP

For further information on Crystal products, please visit our website "www.crystal.com" or call our literature department (800) 888-5016 ext. 3594 or (512) 912-3594 for data sheets and application notes.



Sales Office and Applications Support

UNITED STATES

Sales Office and Applications Support:

WESTERN AREA

Cirrus Logic
Crystal Semiconductor Div.
50 Airport Pkwy.
San Jose, CA 95110
Ph: 408-437-7743
FAX: 408-437-4943

Cirrus Logic
Crystal Semiconductor Div.
6 Venture,
Ste. 100
Irvine, CA 92718
Ph: 714-453-5910
FAX: 714-453-5914

CENTRAL AREA

Cirrus Logic
Crystal Semiconductor Div.
14205 Burnet Rd.,
Ste. 400
Austin, TX 78728
Ph: 512-255-8893
FAX: 512-255-0733

EASTERN AREA

Cirrus Logic
Crystal Semiconductor Div.
5511 Capital Center Dr.,
Ste. 103
Raleigh, NC 27606
Ph: 919-859-5393
FAX: 919-859-5334

Cirrus Logic
10 New England Business Center,
Ste. 100
Andover, MA 01810
Ph: 978-794-9138
FAX: 978-794-9998

Cirrus Logic
Crystal Semiconductor Div.
10440 Little Patuxent Pkwy.,
Ste. 300
Columbia, MD 21044-3559
Ph: 410-740-5654
FAX: 410-740-6961

EUROPE

Sales Office and Applications Support:

Cirrus Logic France
Immeuble Andre Malraux
93561 Rosny s/s Bois CEDEX,
France
Ph: +33(148)122812
FAX: +33(148)122810

Cirrus Logic
Crystal Semiconductor (UK) Ltd.
Spectrum Point,
279 Farnborough Rd.,
Farnborough,
Hampshire GU14 7LS,
United Kingdom
Ph: +44(0)1252372762
FAX: +44(0)1252372763

Cirrus Logic GmbH
Muehlfelder-Strasse 2
D-82211 Herrsching, Germany
Ph: +49(08152)92460
FAX: +49(08152)924699

FAR EAST

Sales Office and Applications Support:

CHINA

Cirrus Logic International Ltd.
A-1403, Qiancun Commercial
Mansion
Beijing, China 100029
Ph: (8610)6443-0783
Ph: (8610)6443-0784
Ph: (8610)6443-0785
FAX: (8610)6443-0786

HONG KONG

Cirrus Logic International Ltd.
1203 Park Tower
15 Austin Rd., Tsimshatsui
Kowloon, Hong Kong
Ph: (852)2376-0801
FAX: (852)2375-1202

KOREA

Cirrus Logic, Korea Co., Ltd.
Rm 1302 SangKyung Bldg., 824-
21 YeokSam-Dong,
KangNam-Ku,
Seoul, Korea
Ph: +82(2)565-8561
FAX: +82(2)565-8565

SINGAPORE

Cirrus Logic
Crystal International
6 Kaki Bukit Ave. 1,
Ste. 03-03
Singapore 417940
Ph: +65-743-4111
FAX: +65-742-4111

TAIWAN

Cirrus Logic International Ltd.
Taiwan Branch
10F, No.214 Tun Hwa North Rd.
Taipei, Taiwan R.O.C.
Ph: +886(2)2718-4533
FAX: +886(2)2718-4526

JAPAN

Sales Office and Applications Support:

Cirrus Logic K.K.
Shinjuku Green Tower, Bldg. 26F
6-14-1 Nishi-Shinjuku,
Shinjuku-ku,
Tokyo, 160
Japan
Ph: +81(03)3340-9111
FAX: +81(03)3340-9120



**CRYSTAL SEMICONDUCTOR
PRODUCTS DIVISION**

**PO BOX 17847
4210 S. INDUSTRIAL DRIVE
AUSTIN, TEXAS 78744
512.445.7222 / 800.888.5016
FAX: 512.445.7581**

**WORLDWIDE WEB:
<http://www.crystal.com>**