CH7xxx SDTV/HDTV Encoder TV Connection Detection

1. Introduction

This application note explains the TV connection detection method for Chrontel CH7xxx SDTV/HDTV Encoders. CH7xxx includes CH7009-7012, CH7015, CH7017, CH7019, CH7205 and CH7206. For those Chrontel TV encoders not mentioned above, please contact Chrontel Applications Group for details.

2. Video Output

In order to properly display video, the DAC connection detection procedure must first be completed. Then, depending on which DACs have sensed a connection, the encoder will drive out the corresponding video signals to the connected DACs.

2.1 Connection Detection Procedure

Connection Detect (CD) Register (Register 20h)

Bit	7	6	5	4	3	2	1	0
SYMBOL	X	X	X	DACT3	DACT2	DACT1	DACT0	SENSE
TYPE	X	X	X	R	R	R	R	R/W
DEFAULT:	X	X	X					0

DACT[3:0] (bits 4-1) and SENSE (bit 0) bits of Register CD provide a means to sense the connection of a TV to the four DAC outputs. The status bits, DACT[3:0] correspond to the loading resistance of the four DAC outputs. However, the values contained in these status bits ARE NOT VALID until the sensing procedure has been performed. Use of this Register requires a sequence of events to enable the sensing of outputs, then reading out the applicable status bits.

The connection detection procedure is as follows:

1. Enable all DACs by setting the Power Management Register, Register 49h, accordingly.

2. Set the SENSE bit of the Connection Detect (CD) Register, Register 20h - bit 0 to ’1’. This forces a constant DC current output from the DACs. Note that when SENSE = ’1’, all 4 DACs send out a DC current and no TV synchronization pulses are asserted.

3. Reset the SENSE bit to ’0’. This triggers a comparison between the voltage present on DAC pins itself and the internal reference voltage used for comparison. During this step, each of the four DAC status bits that corresponds to the individual DAC outputs will be set to ’0’ if it is NOT CONNECTED, and ’1’ if it is CONNECTED.

4. Read the status bits. The status bits, DACT[3:0], now contain valid information which can be read to determine which DACs are connected externally. A ’1’ indicates a valid connection and a ’0’ indicates an unconnected DAC.

2.2 Composite, S-Video, and SDTV Component Video Output

The following description applies to all Chrontel encoders. However for encoders with HDTV, the HDTV bit (register 14h, bit 0) must be set to ’0’ for composite, S-video, and SDTV component video output.

(A) Composite output can be generated through the DAC labeled CVBS. A connection must be detected on the CVBS DAC before a composite signal will be generated and gated out of this DAC.*

(B) S-video output can be generated through the DACs labeled Y (Luma) and C (Chroma). A connection must be detected on the chroma DAC before S-video signals will be generated and gated out of the S-video DACs.*

If loads are detected on both CVBS and C DACs then composite and S-video signals will be sent out simultaneously.*

(C) Some encoders are capable of driving YPrPb for SDTV. YPrPb for SDTV can be generated through the DACs labeled Y, Pr and Pb. A connection must be detected on the Pb DAC before YPrPb signals will be generated and gated out of the component video DACs.*

*DACs associated with the desired video output must be powered on, by setting a proper value to the PM (Power Management) Register (Reg. 49h).

2.3 HDTV Component Video Output

If the encoder chip is capable of driving YPrPb for HDTV and an HDTV mode is desired, the HDTV bit (register 14h, bit 0) must be set to ’1’ (default value is ’0’). If the Pb DAC senses a connection, the HDTV YPrPb signals will be generated and gated out of the Y, Pr and Pb DACs.*

*DACs associated with the desired video output must be powered on, by setting a proper value to the PM (Power Management) Register (Reg. 49h).

2.4 Explanation of TV Flash During Detection Process

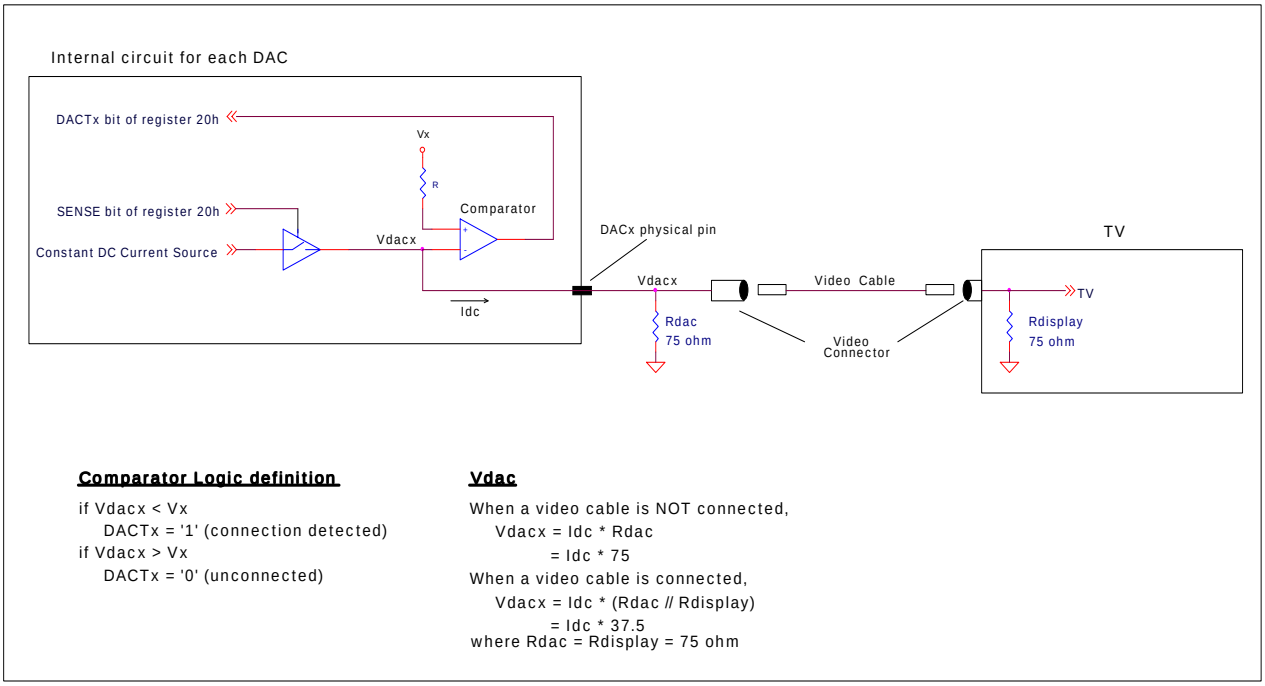

Figure 1: Connection Detection Diagram

Figure 1 illustrates why the TV flashes. The flash is due to the small constant DC current that is driven out of the DACs and flows into the connected TV during the connection detection process. This symptom is normal and will not cause any damage to the connected TV.

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