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AH8304EC
4-Bit RGB
Video D/A Converter

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Introduction

The **AH8304EC** is an RGB 4-bit video D/A Converter featuring an update rate of 150 MHz on each of three 4-bit channels with common composite sync (GREEN channel only), synchronous blanking and strobe controls. Data and control inputs are ECL compatible, and the video output of each channel is RS343/330 compatible. The AH8304EC is packaged in a 24-pin DIP (triple width).

Operation

The **AH8304EC** accepts a 4-bit data word for each of the three video channels (RED, GREEN, and BLUE). The data is presented to the DATA inputs and held for the duration of the setup time. The STROBE is then pulsed to load the data into the three D/As. During the blanking interval, the BLANKING control line is activated by a logic 1. At the next STROBE pulse, this resets the three input registers to 0000 and drives the D/A outputs to the blanking level. When the SYNC line is activated, the output of the GREEN channel is driven
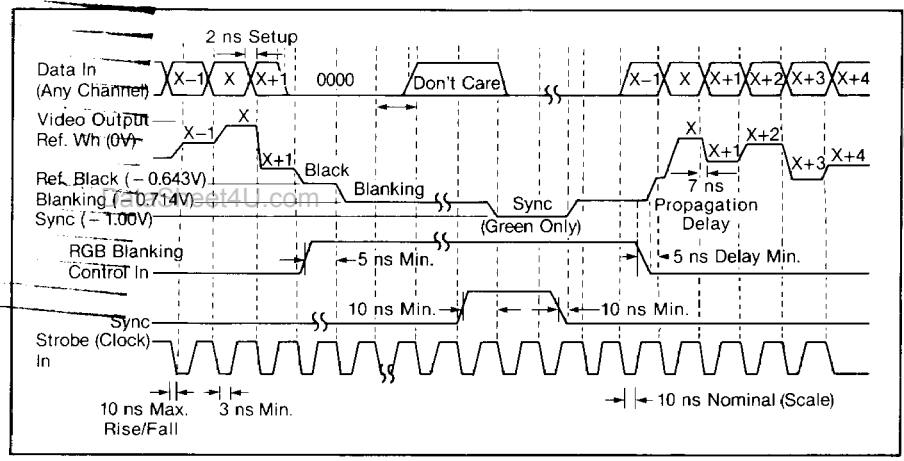
Features

- ECL Logic Compatible
- 150 MHz Update Rate
- Synchronous Blanking
- RS343/330 Composite Video Output
- Low Power Dissipation — 1.0W
- 24-pin DIP

Applications

- Color Graphic Workstations
- Medical Imaging
- CAD/CAM Systems

to the sync level. At the end of the blanking/sync interval, the SYNC and BLANKING controls are released by returning to a logic 0. At the next STROBE to the D/A, the data present at the DATA inputs to the D/A is loaded into the input registers, and will subsequently appear at the D/A outputs after the D/A propagation delay.
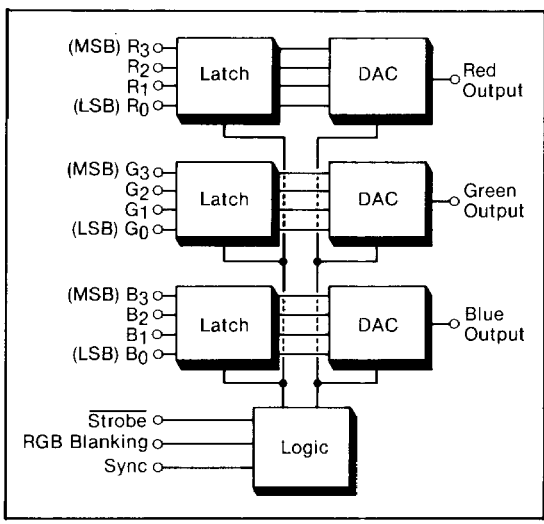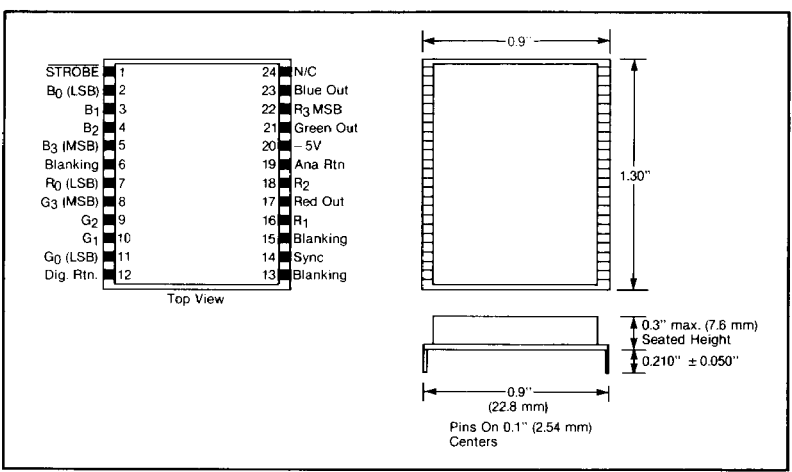

AH8304EC Typical Timing

Figure 1. AH8304EC Block Diagram.

AH8304EC Pinout/Mech.

Specifications

(All specifications guaranteed at 25°C unless otherwise noted)

Output Characteristics (Each Channel)

Composite Output (GREEN Channel only)
0V to −1.00V, ±3% of full scale into 75Ω termination

Gray Scale Output (all Channels)
0V to −0.643V, ±3% of Gray Scale; assumes load of 75Ω ±0.5% and −5.0V negative power supply

Recommeded Load Impedance
75Ω, ±5%, dc to 50 MHz

Source (Thevenin) Impedance
75Ω, ±5%, dc to 50 MHz

LSB Size
42.9 mV, nominal

Full-Step Settling Time
5 ns typical, 7 ns maximum to 1 LSB (0.4%) after propagation delay

Glitch Area
250 pV-sec maximum

Cable Drive Capacity
75Ω characteristic impedance; to avoid appreciable signal loss, total length should have no more than 7.5Ω dc resistance

Composite Sync Level (GREEN Channel Only)
−1.00V absolute, −0.286V (−40 IRE Units) relative to Blanking level

Composite Blanking Level
−0.714V, with 71 mV (10 IRE Units) setup

Transfer Characteristics (Each Channel)

Resolution
4 bits, 16 Gray Scale levels; 42.9 mV per step, nominal

Coding
Binary

Reference White Level
1111 produces 0.000V absolute; +0.714V (100 IRE Units) relative to Blanking level

Reference Black Level
0000 produces −0.643V absolute; +0.071V (10 IRE Units) relative to Blanking level

Differential Linearity
±1/2 LSB maximum

Monotonicity
Guaranteed

Offset (DC Output at REFERENCE WHITE)
±1/2 LSB maximum, 0°C to +55°C

Propagation Delay
7 ns typical, strobe to output; 50% points

Control Input Speed (SYNC, BLANKING)
8 ns typical to settle to 10% of final value after propagation delay

Input Characteristics (Each Channel)

Logic Levels (all inputs)
10,000 Series ECL levels
Logic 0 = −1.75V
Logic 1 = −0.9V

Loading (All inputs)
5 pF; open transistor base; open input is logic 0

Data Validity
Data must be valid 2.0 ns prior to Strobe and remain valid for 1.5 ns after data Strobe

Update Rate
150 MHz maximum

Common Control Inputs

Strobe Input
Data entered on negative-going edge (Timing Reference) on all three channels simultaneously

Pulse Width
3.0 ns minimum

Rise and Fall Time
<10 ns (10% to 90%)

Composite Blanking
Logic 1 on Blanking input simultaneously resets all input registers to 0000, and drives all channel outputs to −0.714V; Blanking is synchronous with falling edge of next STROBE pulse; after logic 1 to 0 transition, all channel outputs will remain at the Blanking level until the next STROBE pulse, at which time data present at the DAC inputs is loaded into the DACs

Composite Sync
Logic 1 on SYNC input (after Blanking is activated) drives the GREEN channel output further negative to −1.00V; when SYNC is released (returned to logic 0), all channel outputs will remain at the Blanking level until the next STROBE pulse which will load the data present at the DAC inputs (assuming BLANKING control is inactive)

Power Supply Requirements

−5.0V
250 mA maximum; 5 mV p-p ripple maximum (−4.75V to −5.5V operating range)

Power Dissipation
1.0 watts typical, 1.25 watts maximum

Environmental and Mechancial

Operating Temperature Range
0°C to +70°C

Storage Temperature
−25°C to +100°C

Relative Humidity
0 to 85%, non-condensing up to +40°C

Mechanical Dimensions
0.90" x 1.30" x 0.3" maximum
(22.9 x 33.14 x 7.62 mm)
24-pin ceramic DIP (triple width)

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