CEM3365 Fast Dual DAC Multiplier

Preliminary, Nov. 1985

DESCRIPTION

The CEM 3365 is a dual high speed one quadrant multiplier intended to scale the output of fast bipolar DACs in digital audio applications, such as DCOs. Each half of the 3365 contains a very fast op amp and a high speed current in/current out gain cell, whose gain is controlled by the output of the op amp. The settling time for a full-scale 12-bit excursion is 150ns. Typical (200ns max.) This response is in contrast to the 10's of uS which would result from changing the reference input of even the fastest bipolar multiplying DACs.

As both inputs and outputs of the op amp are externally available, two modes of operation are possible. One is to configure the op amp as the current-to-voltage converter of a second bipolar control DAC, so that the gain may be controlled directly by a digital word. Effective resolution of the result is the sum sum of the resolutions of the two DACs (24 bits for two 12 bit DACs). The second mode is to configure the op amp simply as a voltage follower, allowing the gain to be controlled by a voltage (from a Sample/Hold, for example).

Although the input to the gain cell is limited to unipolar current, the output may be made bipolar simply by connecting a proper resistor from the op amp output to the gain cell output. Additional versatility is provided by the reference voltage pin, which accurately sets the op amp voltage required for maximum gain.

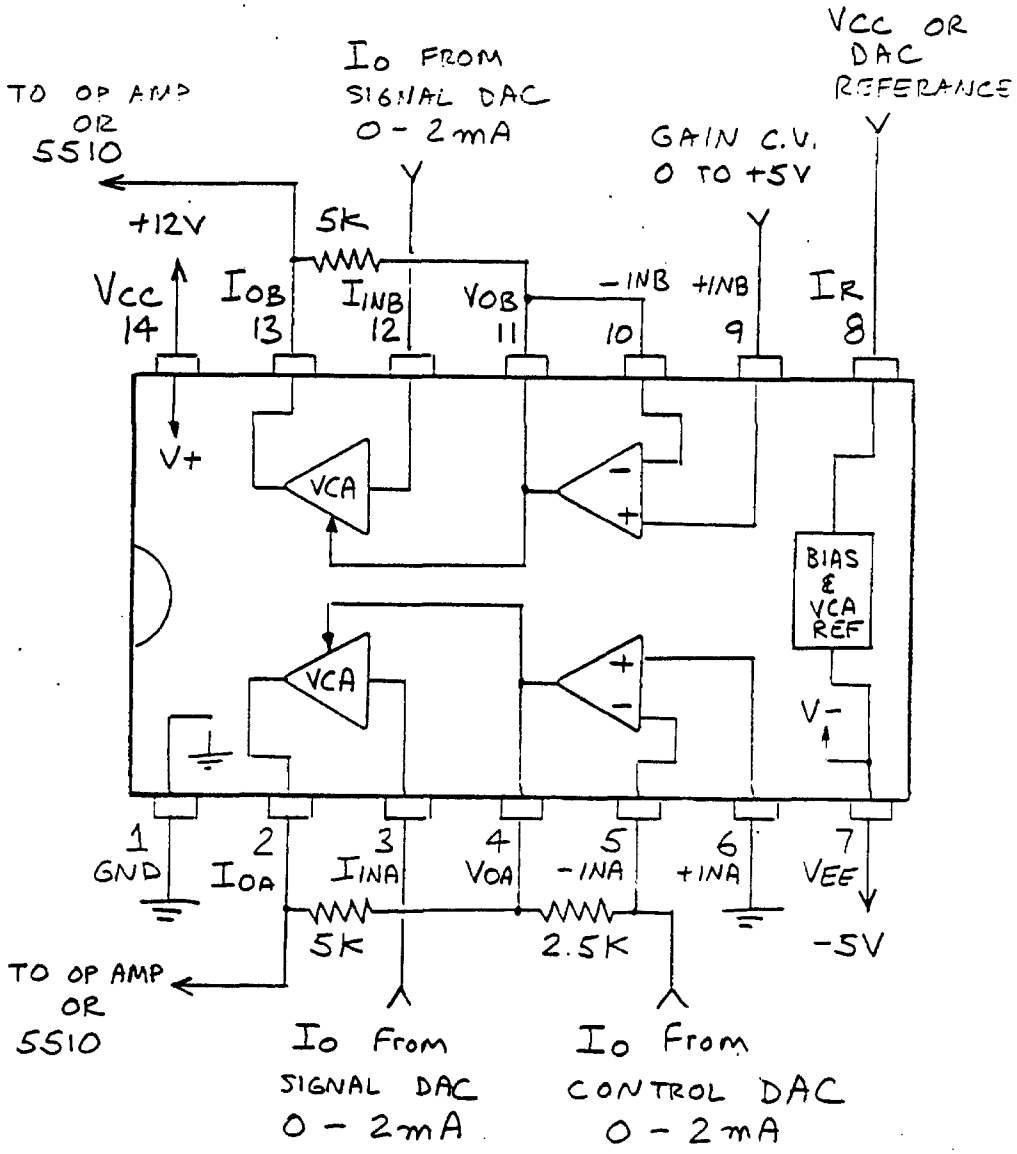
A typical application for the 3365 would be to control the amplitude of digitially generated audio signals in a multiplexed system. When used with a CEM5510 Fast Octal S/H, 8 channels of digital audio with individual amplitude control at 24 bits of resolution can be generated.

Fast, flexible, and requiring few support components, the CEM3365 offers an inexpensive alternative to the high speed hardware digital multipliers required in multiplexed digital audio systems.

FEATURES

- Fast multiplication of bipolar DAC outputs: settling tine < 200ns.
- Gain controllable by another DAC or by a control voltage
- Two independent multipliers in a single 14 pin DIP package
- Adjustable voltage level required for maximum gain

TYPICAL CONNECTION



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