



Using the T7570 Single-Supply Codec

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Description	1	The Lucent Technologies Microelectronics Group T7570* can be used as a replacement part for the National Semiconductor, Inc., <i>TP3070 Combo II</i> †. However, because the Lucent T7570 is a +5 V only device, a slight circuit modification must be made: one capacitor should be repositioned (see Figure 1).
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Single-Supply Differences

The T7570's +5 V only operation allows designers to take advantage of this feature by eliminating a –5 V power supply and associated capacitor. In most applications, the T7570 can be used directly in the TP3070 socket with only slight circuit modifications.

To use the T7570 instead of the TP3070, take the following into account:

- The T7570 does not draw any power supply current from pin 3 (the –5 V pin on the TP3070). The power supply bypass capacitor associated with that pin can be omitted when using the T7570.
- The analog input and output of T7570 are referenced to +2.4 V instead of ground. In most applications, the simple addition of 0.1 μ F capacitors in series with input and output pins (VFXI and VFRO) enables compatible operation. No additional biasing is needed since both the TP3070 and T7570 self-bias at their reference levels.
- Because the output swing of the T7570 is limited by its single-supply operation, the programmable gain ranges of the T7570 are 19.4 dB. In most applications, a 19.4 dB range is adequate, so this is not a significant limitation. If the larger, full-scale voltage available from the TP3070 is required, this higher voltage can usually be achieved within the transformer or electronic hybrid. Gain settings would also have to change.

*The T7570 operates over the full –40 °C to +85 °C temperature range.

†TP3070 Combo II is a trademark of National Semiconductor, Inc.

Programming Note

After a power reset or a master reset, the T7570 must receive a CCLK pulse before writing to any register.

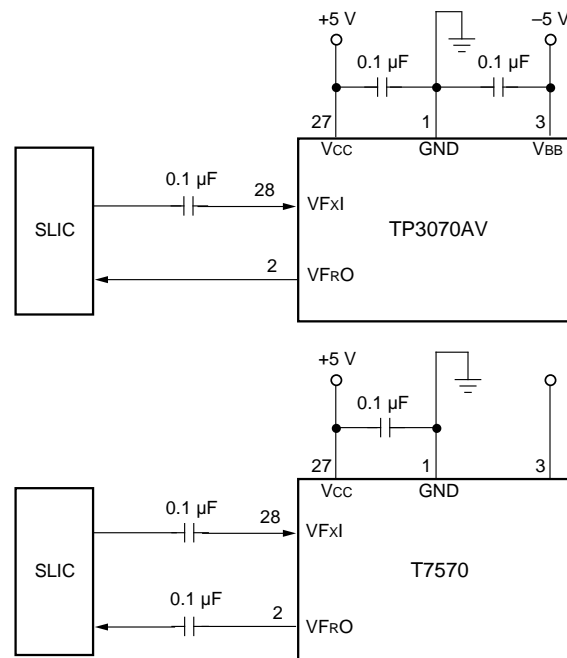
Latches

The T7570 data sheet (DS96-223ALC) specifies latch output voltage with a load current of 1 mA. This current guarantees that the device satisfies the logic output levels specified in the data sheet. The latch is capable of sinking up to 15 mA, however, when programmed as an

output. This drive current can be useful when interfacing nonlogic devices like solid-state relays or low-current electromechanicals.

Latch-Up

Because Lucent paid particular attention to design rule and layout practices, the T7570 demonstrates a high immunity to latch-up problems. Details of our latch-up qualification testing can be obtained from your Lucent Account Representative.



5-2723C

Figure 1. Application Comparison

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