



# ***Reliability Report***

**Report Title:** Process Transfer from the 6inch to 8inch  
3um SPSM 5V BiCMOS L Process at  
ADLK.

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## Summary

This report covers the qualification of the Process Transfer of the AD7874 and ADG608 from the 6" to 8" 3um SPSM 5V BiCMOS L Process.

This report also covers the transfer of the ADG609, ADG619, ADG620, ADG623, ADG601, ADG622, ADG602, ADG621, AD7840, AD79010, AD7874MIL, AD7840MIL, AD7244, AD7871, AD7872, AD7870, AD7875, AD7876, ADG604, ADG611, ADG612, ADG613, ADG658, ADG659, ADG633, ADG636, AD7824, and the AD7821 using substitute data.

## Product Description

The AD7874 is a four-channel simultaneous sampling, 12-bit data acquisition system. The part contains a high speed 12-bit ADC, on chip reference, on-chip clock and four track/hold amplifiers. This latter feature allows the four input channels to be sampled simultaneously, thus preserving the relative phase information of the four input channels, which is not possible if all four channels share a single track/hold amplifier. This makes the AD7874 ideal for applications such as phased array sonar and ac motor controllers where the relative phase information is important.

The ADG608 is a monolithic CMOS analog multiplexer comprising 8 single channels. The ADG608 switches one of eight inputs to a common output as determined by the 3-bit binary address lines A0, A1, and A2. An EN input on both devices is used to enable or disable the device. When disabled, all channels are switched off.

The ADG609 is a monolithic CMOS analog multiplexer comprising four differential channels. The ADG609 switches one of four differential inputs to a common differential output as determined by the 2-bit binary address lines A0 and A1. An EN input on both devices is used to enable or disable the device. When disabled, all channels are switched off.

The AD7840 is a fast, complete 14-bit voltage output D/A converter. It consist of a 14-bit DAC, 3V buried Zener reference, DAC output amplifier and high speed control logic.

The AD7871 and AD7872 are fast, complete, 14-bit analog-to-digital converters. They consist of a track/hold amplifier, successive-approximation ADC, 3V buried zener reference and versatile interface logic. The AD7871 offers a choice of three data output formats: a single, parallel, 14-bit word; two 8-bit bytes or a 14-bit serial data stream. The AD7872 is a serial output device only. The two parts are capable of interfacing to all modern microprocessors and digital signal processors.

The AD7244 is a fast, complete, dual 14-bit voltage output D/A converter. It consists of a 14-bit DAC, 3V buried Zener reference, DAC output amplifiers and high speed serial interface logic.

The ADG604 is a CMOS analog multiplexer, comprising of four single channels. It operates from a dual supply of +/-2.7V to +/-5.5V, or from a single supply of +2.7V to 5.5V. The

ADG604 switches one of four inputs to a common output, D, as determined by the 3-bit binary address lines, A0, A1 and EN. A Logic “0” on the EN pin disables the device.

The ADG611, ADG612 and ADG613 are monolithic CMOS devices containing four independently selectable switches. These switches offer ultra-low charge injection of 1pC and leakage currents of 100pA at +25C. The ADG611 and ADG612 differ only in that the digital control logic is inverted. The ADG611 switches are turned on with a logic low on the appropriate control input, while a logic high is required to turn on the switches of the ADG612. The ADG613 contains two switches whose digital control logic is similar to the ADG611, while the logic is inverted on the other two switches.

The ADG636 is a monolithic device, comprising of two independently selectable CMOS SPDT (Single Pole, Double Throw) switches. Each switch conducts equally well in both directions when on. The ADG636 operates from a dual +/-2.7V to +/-5.5V supply, or from a single supply of +2.7V to +5.5V.

The ADG601 and ADG602 are monolithic CMOS SPST (Single Pole, Single Throw) switches with ON Resistance typically less than 2.5ohm. The ADG601 is a normally open (NO) switch, while the ADG602 is normally closed (NC).

The ADG619 and ADG620 are monolithic CMOS SPDT (Single Pole, Double Throw) switches. These switches provide low power dissipation yet give high switching speed, low ON resistance and low leakage currents.

The ADG621, ADG622 and ADG623 are monolithic CMOS SPST (Single Pole, Single Throw) switches. These switches provide low power dissipation yet give high switching speed, low ON resistance and low leakage currents. The ADG621 and ADG622 differ only in that both switches are normally open (NO) and normally closed (NC) respectively. In the ADG623 Switch 1 is normally open and switch 2 is normally closed. The ADG623 exhibits break-before-make switching action.

The AD7870, AD7875 and AD7876 are fast, complete 12-bit A/D converters. They accept input signal ranges of +/-3V, +5V and +/-10V, respectively.

The ADG633 is a low voltage CMOS device comprising three independently selectable SPDT (single pole double throw) switches.

The ADG658 and ADG659 are low voltage, CMOS analog multiplexers comprising eight single channels and four differential channels respectively. The ADG658 switches one of eight inputs (S1-S8) to a common output, D, as determined by the 3-bit binary address lines A0, A1 and A2. The ADG659 switches one of four differential inputs to a common differential output as determined by the 2-bit binary address lines A0, A1. Both parts have an EN input on the device which is used to enable or disable the device. When disabled all channels are switched off.

The AD7824 and AD7828 are high-speed, multi-channel, 8-bit ADCs with a choice of 4 (AD7824) or 8 (AD7828) multiplexed analog inputs.

The AD7821 is a high speed, 8-bit, sampling, analog-to-digital converter that offers

improved performance over the popular AD7820. It offers a conversion time of 660ns (vs. 1.36 $\mu$ s for the AD7820) and 100kHz signal bandwidth (vs. 6.4kHz). The sampling instant is better defined and occurs on the falling edge of WR of RD. The provision for a Vss pin (pin 19) allows the part to operate from +/-5V supplies and to digitize bipolar input signals. Alternatively, for unipolar inputs, the Vss pin can be grounded and the AD7821 will operate from a single +5V supply, like the AD7820.

## AD7874 Product Characteristics

### Die/Fab

<b>Maximum Power Dissipation (W)</b>	0.150
<b>Device / Die ID</b>	L54B
<b>Die Size (mm)</b>	7.50 x 6.90
<b>Wafer Fabrication Site</b>	ADI-Limerick 8"
<b>Wafer Fabrication Process</b>	3.00M1S1M10.5
<b>Transistor Count</b>	7467
<b>Passivation Layer</b>	undoped-oxide/SiN
<b>Bond Pad Metal Composition</b>	AlCu
<b>Polyimide Layer</b>	No

### Package/Assembly

<b>Available Package(s)</b>	28-SOICWB
<b>Body Size (mm)</b>	7.60 x 18.00 x 2.30
<b>Assembly Location</b>	Amkor-P
<b>Die Attach</b>	Ablestik 84-1LMIS R4
<b>Lead Frame Material</b>	Copper
<b>Bond Wire Type</b>	Gold
<b>Bond Wire Dia. (mils)</b>	1.20
<b>Mold Compound</b>	Sumitomo 6600H
<b>Lead Finish</b>	Tin Plate
<b>Moisture Sensitivity Level</b>	1
<b>Maximum Peak Reflow (°C)</b>	240C

## ADG608 Product Characteristics

### Die/Fab

<b>Maximum Power Dissipation (W)</b>	.0325
<b>Device / Die ID</b>	A99B
<b>Die Size (mm)</b>	1.76 x 2.29
<b>Wafer Fabrication Site</b>	ADI-Limerick
<b>Wafer Fabrication Process</b>	3.00M1P1M50.00
<b>Transistor Count</b>	52
<b>Passivation Layer</b>	undoped-oxide/SiN
<b>Bond Pad Metal Composition</b>	AlCu
<b>Polyimide Layer</b>	No

### Package/Assembly

<b>Available Package(s)</b>	16-TSSOP
<b>Body Size (mm)</b>	4.40 x 5.00 x 1.00
<b>Assembly Location</b>	Amkor-P
<b>Die Attach</b>	Ablestik 84-1LMIS R4
<b>Lead Frame Material</b>	Copper
<b>Bond Wire Type</b>	Gold
<b>Bond Wire Dia. (mils)</b>	1.00
<b>Mold Compound</b>	Sumitomo 7351T
<b>Lead Finish</b>	Tin Plate
<b>Moisture Sensitivity Level</b>	1
<b>Maximum Peak Reflow (°C)</b>	260

## Process Qualification Test Results

The below table provides a description of the process qualification tests conducted and the associated test results on the AD7874 and other products manufactured on the same technologies as described in the product characteristics table.

Test Name	Conditions	Specification	Device	Fab Process	Lot #	Sample Size	Qty. Rejects
HTOL	125C<Tj<135C, Biased 1000hrs	JESD22-A108	AD7874	Q3	AC19844.1	77	0
HTOL [1]	125C<Tj<135C, Biased 1000hrs	JESD22-A108	AD7874	Q3	AC22700.1	77	0

- 1) These Samples were subjected to preconditioning (per J-STD-020 Level 3) prior to the start of the stress test. Level 3 preconditioning consists of the following: Bake: 24 hrs @ 125°C, Soak: Unbiased Soak: 192 hrs @ 30°C, 60%RH, Reflow: 3 passes through an oven with a peak temperature of 260+0/-5°C.

Samples of the many devices manufactured with these process technologies are continuously undergoing reliability evaluation as part of the ADI Reliability Monitor Program. Additional qualification data is available on Analog Devices' web site

## ESD Test Results

The results of Human Body Model (HBM) and Field Induced Charge Device Model (FICDM) ESD testing are summarized in the ESD Results Table. ADI measures ESD results using stringent test procedures based on the specifications listed in the table below. Any comparison with another supplier's results should ensure that the same ESD test procedures have been used. For further details, please see the EOS/ESD chapter of the ADI Reliability Handbook at <http://www.analog.com/world/quality/manuals/>.

Part Name	ESD Model	Package	ESD Test Spec	RC Network	Highest Pass Level	First Fail Level	Class
AD7874	FICDM	28-SOICWB	ESD Assoc. STM5.3.1-1999	1 Ohm, Cpkg	1000V	1500V	C5
ADG608	FICDM	16-TSSOP	ESD Assoc. STM5.3.1-1999	1 Ohm, Cpkg	1500V	NA	C6
AD7874	HBM	28-SOICWB	ESD Assoc. STM5.1-2001	1.5 kOhm, 100pF	1500V	2000V	1C
ADG608	HBM	16-TSSOP	ESD Assoc. STM5.1-2001	1.5 kOhm, 100pF	5500V	NA	3A

## Latch-Up Test Results

Six samples of the AD7874 passed Latch-up testing at Ta=25°C per JEDEC Standard JESD78, Class I.

## **Approvals**

Reliability Engineer: Fergus Downey

This report has been approved by electronic means (3.6).

## **Additional Information**

Data sheets and other additional information are available on Analog Devices' web site at the addresses shown below.

**Home Page:** <http://www.analog.com>  
**Sales Info:** [http://www.analog.com/world/corp\\_fin/sales\\_directory/distrib.html](http://www.analog.com/world/corp_fin/sales_directory/distrib.html)  
**Reliability Data:** <http://www.analog.com/world/quality/read/1stpage.html>  
**Reliability Handbook:** <http://www.analog.com/corporate/quality/manuals/>