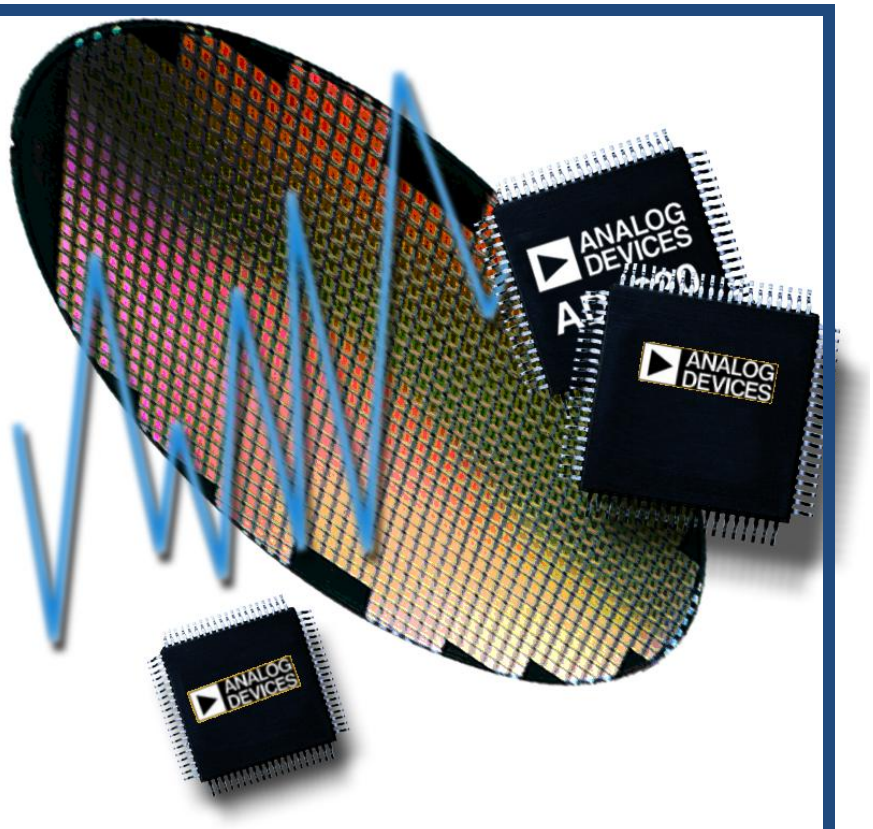

Reliability Report

Report Title: AD620 Die Revision B

Report Number: 8757

Revision: C

Date: 3 January 2011

Summary

This report documents the successful completion of the reliability qualification requirements for release of the AD620 Revision B die. The product is in an 8-SOIC_N package.

Table 1: AD620 Product Characteristics

Die/Fab

Die ID	AD620B
Die Size (mm)	2.23 x 1.78
Wafer Fabrication Site	WILM1B06
Wafer Fabrication Process	BIPOLAR3
Transistor Count	93
Passivation Layer	doped-oxide/SiN
Bond Pad Metal Composition	AlCu
Maximum Current Density (mA/µm)	1.80
Die Overcoat	Polyimide

Package/Assembly

Available Package	8-SOIC_N
Body Size (mm)	4.00 x 5.00 x 1.50
Assembly Location	Carsem-M
Molding Compound	Sumitomo 6600H
Wire Type	Gold Tanaka M3
Wire Diameter (mils)	1.30
Die Attach	Ablestik 84-1LMIS R4
Lead Frame Material	Copper Olin 194
Lead Finish	Matte Sn
Moisture Sensitivity Level	1
Maximum Peak Reflow Temperature (°C)	260

Description / Results of Tests Performed

Tables 2 and 3 provide a description of the qualification tests conducted and the associated test results for products manufactured on the same technologies as described in Table 1. All devices were electrically tested before and after each stress. Any device that did not meet all electrical data sheet limits following stressing would be considered a valid (stress-attributable) failure unless there was conclusive evidence to indicate otherwise.

Table 2: Package Qualification Test Results

Test Name	Spec	Conditions	Device	Package	Lot #	Sample Size	Qty. Failures
Autoclave (AC)[1]	JESD22-A102	121°C 100%RH 2atm 168 hours	AD627	Carsem-S 8-SOIC_N	AA24682.1	77	0
					R50155.1	74	0
					R50156.1	77	0
			OP295		R37138.1	77	0
					R45371.1	77	0
		121°C 100%RH 2atm 96 hours	AD22057	Carsem-M 8-SOIC_N	AC80433.1	50	0
			AD620		AC52212.1	77	0
					AC52213.1	77	0
			AD623		AB57524.1	50	0
Biased HAST (HAST)[1]	JESD22-A110	130°C 85%RH 2atm, Biased 96 hours	AD627	Carsem-S 8-SOIC_N	R50157.1	77	0
					R50158.1	77	0
					R50159.1	77	0
			AD712		AC22925.1	77	0
			OP295		R37139.1	77	0
					R45372.1	77	0
					R45373.1	77	0
Solder Heat Resistance (SHR)[1]	ADI-0049	See Footer	AD620	Carsem-M 8-SOIC_N	Q8757.5	30	0
					AC52215.1	10	0
					AC52216.1	10	0
					AC52217.1	10	0
					AC52218.1	10	0
Temperature Cycling (TC)[1]	JESD22-A104	-65°C / +150°C 1,000 cycles	AD8138A	Carsem-M 8-SOIC_N	Q7625.100	77	0
Temperature Cycling (TC)[1]	JESD22-A104	-65°C / +150°C 1,000 cycles	AD627	Carsem-S 8-SOIC_N	R56197.1	77	0
					R56198.1	77	0
			OP295		R37141.1	77	0
					R45376.1	77	0
					R45377.1	77	0
		-65°C / +150°C 500 cycles	AD22057	Carsem-M 8-SOIC_N	AC80434.1	50	0
			AD620		AC52219.1	77	0
					AC52221.1	77	0
					AC52222.1	77	0
					AD84785.1	77	0
			AD623		AB57526.1	15	0
			AD712	Carsem-S 8-SOIC_N	AC22926.1	77	0
Thermal Shock (TS)[1]	JESD22-A106	-65°C / +150°C 1,000 cycles	OP295	Carsem-S 8-SOIC_N	R37142.1	77	0
					R45378.1	77	0

1) These Samples were subjected to preconditioning (per J-STD-020 Level 1) prior to the start of the stress test. Level 1 preconditioning consists of the following: Bake: 24 hrs @ 125ºC, Soak: Unbiased Soak: 168 hrs @ 85ºC, 85%RH, Reflow: 3 passes through an oven with a peak temperature of 260ºC.

Table 3: >2.5um² Bipolar at WILM1B06 Fab Qualification Test Results

Test Name	Spec	Conditions	Device	Fab Process	Lot #	Sample Size	Qty. Failures
Early Life Failure Rate (ELFR)[1]	MIL-STD-883, Method 1015	125°C 48 hours	AD712	WILM1B06 >2.5um² Bipolar	Q8062.350	259	0
					Q8062.351	260	0
					Q8062.352	260	0
					Q8062.353	260	0
					Q8062.354	260	0
					Q8062.355	260	0
					Q8062.356	260	0
					Q8062.357	190	0
Early Life Failure Rate (ELFR)					AC80706.1	398	0
					AC80706.2	349	0
					AC80734.1	260	0
Biased HAST (HAST)[2]	JESD22-A110	110°C 85%RH 2atm, Biased 96 hours	AD712		M57757.1	77	0
					M33899.1	77	0
					M33898.1	77	0
		130°C 85%RH 2atm, Biased 96 hours			M51172.1	77	0
Biased HAST (HAST)[3]	JESD22-A110	130°C 85%RH 2atm, Biased 96 hours	AD712		M51057.1	77	0
					AC22925.1	77	0
High Temperature Operating Life (HTOL)	JESD22-A108	125°C ‹ Tj ‹ 135°C, Biased 1,000 hours	AD712		N91089.1	45	0
					N91415.1	45	0
					AC80892.1	50	0
					M90711.1	45	0
					M90871.1	45	0
High Temperature Operating Life (HTOL)[3,1]	JESD22-A108	150°C ‹ Tj ‹ 175°C, Biased 500 hours	AD8221		Q7860.1	77	0
					Q7860.2	77	0
					Q7860.8	77	0
					Q7860.7	77	0
High Temperature Storage Life (HTSL)	JESD22-A103	150°C 1,000 hours	AD712		AC17811.1	77	0
					L77318.1	77	0
Temperature Humidity Bias (THB)	JESD22-A101	85°C 85%RH, Biased 1,000 hours	AD22103		353036	50	0
			AD22057		Q4779.1	30	0

1) Electrical test was performed at ambient temperatures.
2) These Samples were subjected to preconditioning (per J-STD-020 Level 1) prior to the start of the stress test. Level 1 preconditioning consists of the following: Bake: 24 hrs @ 125ºC, Soak: Unbiased Soak: 168 hrs @ 85ºC, 85%RH, Reflow: 3 passes through an oven with a peak temperature of 240ºC.
3) These Samples were subjected to preconditioning (per J-STD-020 Level 1) prior to the start of the stress test. Level 1 preconditioning consists of the following: Bake: 24 hrs @ 125ºC, Soak: Unbiased Soak: 168 hrs @ 85ºC, 85%RH, Reflow: 3 passes through an oven with a peak temperature of 260ºC.

Samples of the many devices manufactured with these package and 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), Machine Model (MM), 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. 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 (available via the 'Quality and Reliability' link at the Analog Devices' web site).

Table 4: ESD Test Results

ESD Model	Package	ESD Test Spec	RC Network	Highest Pass Level	First Fail Level	Class
FICDM	8-SOIC_N	JESD22-C101	1Ω, Cpkg	±1500V	NA	C6
HBM		ANSI/ESDA/JEDEC JS-001-2010	1.5kΩ, 100pF	±1000V	±1500V	1C
MM		JESD22-A115	0Ω, 200pF	±200V	±400V	M3

Latch-Up Test Results

Six samples of the AD620 were Latch-up tested at T_A=25ºC per JEDEC Standard JESD78, Class I, Level A. All six devices passed.

Approvals

This report has been approved by electronic means (5.0).
Reliability Engineer: Denis Belisle

Additional Information

Data sheets and other additional information are available on Analog Devices' web site.