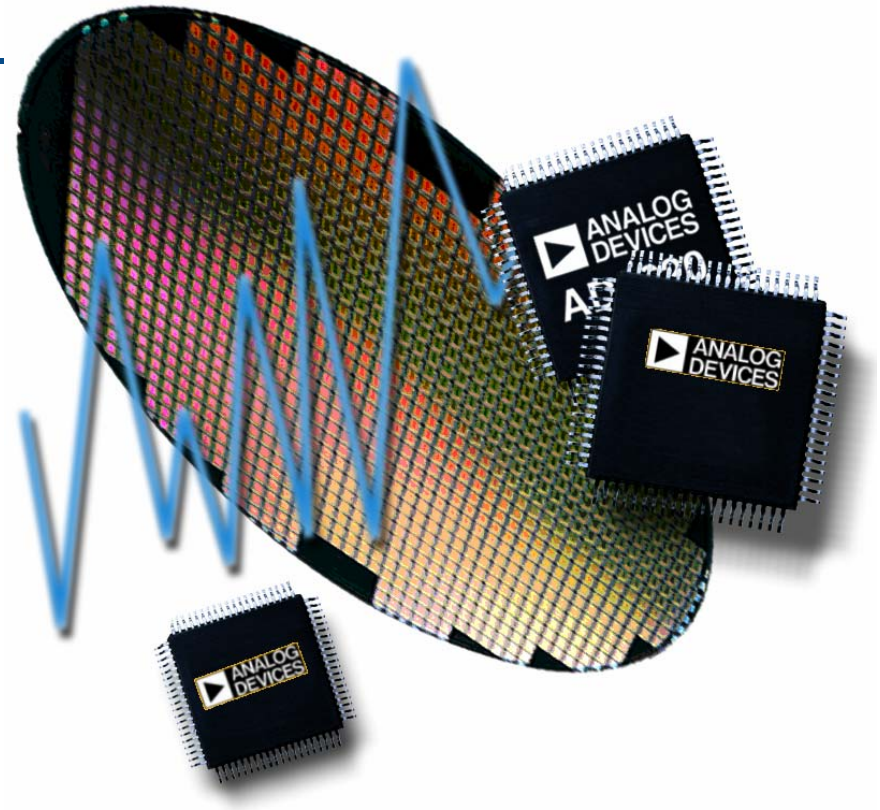

Reliability Report

Report Title: **EP130 8” Transfer Qualification of the ADUM1220, ADUM1223, ADUM1230 and ADUM1233**

Report Number: **5958**

Date: **1 February 2007**

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Summary

This report documents the successful completion of the reliability qualification requirements for release of the ADUM1220, ADUM1223, ADUM1230 and ADUM1233 products.

The ADUM1220, ADUM1223, ADUM1230 and ADUM1233 are isolated half-bridge gate drivers that employs Analog Devices iCoupler technology to provide independent and isolated high-side and low-side outputs. Combining high speed CMOS and monolithic transformer technology, these isolated components provide outstanding performance characteristics superior to optocoupler-based solutions.

The ADUM1220 is the main vehicle used for this qual. The ADUM1223 is a variant of the ADUM1220 while the ADUM1233 has the same die as the ADUM1223, and the ADUM1230 has the same die as the ADUM1220.

Table 1. ADUM1220/30 Product Characteristics

Device

Device / Die ID	ADuM1220GD	ADuM1220TC	ADuM1220IC(TMN188A)
Die Size (mm)	0.870 x 0.860	1.12 x 1.92	0.89 x 1.27
Wafer Fabrication Site	ADI-Limerick	TSMC Fab - 09	TSMC Fab - 09
Wafer Fabrication Process	H6DPTM	0.6um DPTM CMOS	
Passivation Layer	undoped-oxide/SiN	doped-oxide/SiN	undoped-oxide/SiN
Bond Pad Metal Composition	AlCu		

Package/Assembly

Available Package(s)	16-SOICWB
Body Size (mm)	7.60 x 10.50 x 2.35
Assembly Location	Carsem-M
Die Attach	Ablestik 84-3J
Lead Frame Material	Copper
Bond Wire Type	Gold
Bond Wire Dia. (mils)	1.30
Mold Compound	Sumitomo 6600H
Lead Finish	S.B. 100Sn
Moisture Sensitivity Level	1
Maximum Peak Reflow (°C)	260C (-5C/+0C)

Table 2. ADUM1223/33 Product Characteristics

Device

Device / Die ID	ADuM1223GD	ADuM1223TC	ADuM1220IC(TMN188-0001A)
Die Size (mm)	0.870 x 0.860	1.12 x 1.92	0.89 x 1.27
Wafer Fabrication Site	ADI-Limerick	TSMC Fab - 09	TSMC Fab - 09
Wafer Fabrication Process	H6DPTM	0.6um DPTM CMOS	
Passivation Layer	undoped-oxide/SiN	doped-oxide/SiN	undoped-oxide/SiN
Bond Pad Metal Composition	AlCu		

Package/Assembly

Available Package(s)	16-SOICWB
Body Size (mm)	7.60 x 10.50 x 2.35
Assembly Location	Carsem-M
Die Attach	Ablestik 84-3J
Lead Frame Material	Copper
Bond Wire Type	Gold
Bond Wire Dia. (mils)	1.30
Mold Compound	Sumitomo 6600H
Lead Finish	S.B. 100Sn
Moisture Sensitivity Level	1
Maximum Peak Reflow (°C)	260C (-5C/+0C)

Description/Results of Tests Performed

Table 3 thru 5 provide a description of the qualification tests conducted and the associated test results on the ADG1208, ADP3120A, ADUM1220, and ADUM1223 and other products manufactured on the same technologies as described in the product characteristics tables.

Table 3. ADUM1220 Qualification Test Results

	Conditions	Specification	Device	Fab Process	Lot Num	Sample Size	Qty. Rejects
ELF	125C 48hrs	MIL-STD-883, Method 1015	ADUM1220	MCM: NA, 0.6um DPTM CMOS, and H6DPTM	R69986.1	168	0
					R69986.2	168	0
					R69986.3	168	0
					R69986.4	166	0
					R76048.1	168	0
					R76048.2	168	0
					R76048.3	167	0
					R76048.4	166	0
					R86341.1	250	0
					R86341.2	250	0
					R86341.3	168	0

HAST [1]	130C 85%RH 2atm, Biased 96hrs	JEDEC-STD-22, Method A110	ADUM1220	MCM: NA, 0.6um DPTM CMOS, and H6DPTM	NA	77	0
					R69990.1	77	0
					R69991.1	77	0
					R86362.1	77	0
HTOL	125C<Tj<135C, Biased 1000hrs	JESD22-A108	ADUM1220	MCM: NA, 0.6um DPTM CMOS, and H6DPTM	NA	77	0
					R85067.1	77	0
					R86352.1	76	0
					R86402.1	77	0
Autoclave [1]	121C 100%RH 2atm 168hrs	JEDEC-STD-22, Method A102	ADUM1220	MCM: NA, 0.6um DPTM CMOS, and H6DPTM	NA	77	0
					R69988.1	77	0
					R69989.1	77	0
					R86361.1	77	0
HTS	150C 1000hrs	JEDEC-STD-22, Method A103	ADUM1220	MCM: NA, 0.6um DPTM CMOS, and H6DPTM	NA	77	0
					R69639.1	77	0
					R69640.1	77	0
					R86351.1	77	0
SHR [1]	See Below	ADI-0049	ADUM1220	MCM: NA, 0.6um DPTM CMOS, and H6DPTM	NA	0	0
					R69994.1	10	0
					R69995.1	10	0
					R86364.1	10	0
Temp Cycle [1]	-65C/+150C 500cycles	JEDEC-STD-22, Method A104	ADUM1220	MCM: NA, 0.6um DPTM CMOS, and H6DPTM	NA	77	0
					R69992.1	77	0
					R69993.1	77	0
					R86363.1	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 @ 125°C
- Unbiased Soak: 168 hrs @ 85°C, 85%RH
- Reflow: 3 passes through an oven with a peak temperature of 260+0/-5°C

Samples of the many devices manufactured with this packaging technology are continuously undergoing reliability evaluation as part of the ADI Reliability Monitor Program. Additional qualification data is available on Analog Devices' web site at: http://www.analog.com/corporate/quality/read/1stpage.html.

Table 4. Process Qualification Test Results

Test Name	Conditions	Specification	Part Number	Fab Process	Lot Number	Sample Size	Qty. Rejects
ELF	125C 48hrs	MIL-STD-883, Method 1015	ADG1208	H6DPTMI	R61593.1	450	0
				H6DPTMI	R61593.2	220	0
					R61595.1	450	0
					R61595.2	220	0
					R79294.1	600	0
					R79294.2	70	0
			ADP3120A	H6_16VDPDMI	R31644.2	318	0
					R31644.3	352	0
					R39265.2	510	0
					R39265.3	58	0
					R39266.2	270	0
					R39266.3	80	0
HAST [1]	130C 85%RH 2atm, Biased 96hrs	JEDEC-STD-22, Method A110	ADG1208	H6DPTMI	R64524.1	77	0
					R69860.1	77	0
					R69861.1	77	0
			ADP3120A	H6_16VDPDMI	R42848.1	77	0
					R42849.1	77	0
					R42849.2	41	0
					R42850.1	77	0
HTOL	125C<Tj<135C, Biased 1000hrs	JESD22-A108	ADG1208	H6DPTMI	R61594.1	77	0
					R64552.1	77	0
					R85068.1	77	0
			ADP3120A	H6_16VDPDMI	R31644.1	75	0
					R39265.1	76	0
					R39266.1	76	0
Autoclave [1]	121C 100%RH 2atm 168hrs	JEDEC-STD-22, Method A102	ADG1208	H6DPTMI	R64522.1	77	0
					R69859.1	77	0
			ADP3120A	H6_16VDPDMI	R42845.1	77	0
					R42846.1	77	0
					R42847.1	77	0
HTS	150C 1000hrs	JEDEC-STD-22, Method A103	ADP3120A	H6_16VDPDMI	R42851.1	77	0
					R42852.1	77	0
					R42853.1	77	0
SHR [1]	See Below	ADI-0049	ADG1208	H6DPTMI	R64523.1	10	0
					R64525.1	10	0
					R69862.1	10	0
					R69863.1	77	0
					R69864.1	77	0
			ADP3120A	H6_16VDPDMI	R42854.1	10	0
					R42855.1	10	0

					R42856.1	10	0
Temp Cycle [1]	-65C/+150C 500cycles	JEDEC-STD-22, Method A104	ADP3120A	H6_16VDPDMI	R42857.1	77	0
					R42858.1	77	0
					R42859.1	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 @ 125°C
- Unbiased Soak: 168 hrs @ 85°C, 85%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 at: http://www.analog.com/corporate/quality/read/1stpage.html.

ESD Testing

The results of Human Body Model (HBM), Machine Model (MM), and Field Induced Charge Device Model (FICDM) ESD testing are summarized in Table 5.

ADI measures ESD results using stringent test procedures based on the specifications listed in the above table. 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/corporate/quality/manuals/.

Table 5. ADG1208, ADP3120A, ADUM1220, and ADUM1223 ESD Test Results

ESD Model	Package	Generic	ESD Test Spec	RC Network	Highest Pass Level	First Fail Level	Class
FICDM	16-SOICWB	ADUM1223	ESD Assoc. STM5.3.1-1999	1Ω, Cpkg	1500V	-	C6
FICDM	16-SOICWB	ADUM1220	ESD Assoc. STM5.3.1-1999	1Ω, Cpkg	2000V	-	C7
FICDM	16-TSSOP	ADG1208	ESD Assoc. STM5.3.1-1999	1Ω, Cpkg	1500V	2000V	C6
FICDM	8-SOICnb	ADP3120A	ESD Assoc. STM5.3.1-1999	1Ω, Cpkg	1500V	2000V	C6
FICDM	8-LFCSP	ADP3120A	ESD Assoc. STM5.3.1-1999	1Ω, Cpkg	1500V	2000V	NA
FICDM	16-SOICWB	ADUM1220	ESD Assoc. STM5.3.1-1999	1Ω, Cpkg	2500V	3000V	NA
HBM	8-SOICnb	ADP3120A	ESD Assoc. STM5.1-2001	1.5kΩ, 100pF	1500V	2000V	1C
HBM	16-TSSOP	ADG1208	ESD Assoc. STM5.1-2001	1.5kΩ, 100pF	500	1000V	1B

HBM	16-SOICWB	ADUM1223	ESD Assoc. STM5.1-2001	1.5kΩ, 100pF	2500V	3000V	2
HBM	16-SOICWB	ADUM1220	ESD Assoc. STM5.1-2001	1.5kΩ, 100pF	2000V	2500V	2
MM	16-SOICWB	ADUM1223	ESD Assoc. STM5.2-1999	0Ω, 200pF	100V	200V	M2
MM	16-SOICWB	ADUM1220	ESD Assoc. STM5.2-1999	0Ω, 200pF	100V	200V	M2

Latch-up Testing

Six samples of the ADUM1220, ADUM1223, ADUM1230 and ADUM1233 passed Latch-up testing at Ta=25°C per JEDEC Standard JESD78, Class I, Level A.

Approvals

Reliability Engineer: Mark Forde
This report has been approved by electronic means (3.3).

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
Reliability Data: http://www.analog.com/corporate/quality/read/1stpage.html
Reliability Handbook: http://www.analog.com/corporate/quality/manuals/