



Reliability Report

Report Title: AD7124-4/-8 TSSOP at ASE (AET) Qualification

Report Number: 20189

Revision: A

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Summary

This report documents the successful completion of the reliability qualification requirements for the release of the AD7124-4 product in a 24-TSSOP_4.4 package at ASE (AET). The AD7124-4 is a low power, low noise, completely integrated analog front end for high precision measurement applications.

Die/Fab Product Characteristics

Table 1.1: Die/Fab Product Characteristics- 0.18um CMOS

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data		
Generic/Root Part #	AD7124-4	AD7124-4	AD9322	AD81004
Die Id	TMJB25 / C	TMJB25 / B	TMS023 / A	TMFY08/A-T1
Die Size (mm)	2.78 x 3.64	2.78 x 3.64	3.11 x 3.87	8.57 x 3.24
Wafer Fabrication Site	TSMC Fab-11	TSMC Fab-11	TSMC Fab-11	TSMC Fab-11
Wafer Fabrication Process	0.18um CMOS	0.18um CMOS	0.18um CMOS	0.18um CMOS
Die Substrate	Si	Si	Si	Si
Metallization / # Layers	AlCu/5	AlCu/5	AlCu/5	AlCu/5
Polyimide	Yes	Yes	No	No
Passivation	undoped-oxide/SiN	undoped-oxide/SiN	undoped-oxide/SiN	undoped-oxide/SiN

Die/Fab Test Results

Table 2: Die/Fab Test Results - 0.18um CMOS at TSMC Fab-11

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
Early Life Failure Rate (ELFR)	MIL-STD-883, M1015	125°C, 48 Hours	AD81004	Q11314.10	0/120
				Q11314.11	0/40
				Q11314.12	0/120
				Q11314.13	0/120
				Q11314.5	0/120
				Q11314.6	0/120
				Q11314.7	0/120
				Q11314.8	0/120
				Q11314.9	0/120
				Q11314.EL1a	0/200
				Q11314.EL1b	0/200
				Q11314.EL1c	0/200
				Q11314.EL1d	0/200
				Q11314.EL1e	0/200
				Q11314.EL1f	0/40
				Q11314.EL2a	0/200
				Q11314.EL2b	0/200
				Q11314.EL2c	0/200
Q11314.EL2d	0/200				
Q11314.EL2e	0/200				

High Temperature Operating Life (HTOL) ¹	JESD22-A108	125°C<Tj<135°C, Biased, 1,000 Hours	AD7124-4	Q10560.3	0/77
			AD7124-8	Q13197.HO1	0/77
			AD81004	Q11314.1	0/77
				Q11314.17	0/77
				Q11314.HO1	0/77
			135°C<Tj<150°C, 1,000 Hours	AD7124-4	Q10560.16
		Q10560.17			0/77
		150°C<Tj<175°C, Biased, 500 Hours	AD9322	Q5587.11	0/32
				Q5587.7	0/32
Q5587.9	0/32				
Highly Accelerated Temperature and Humidity Stress Test (HAST) ¹	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	AD81004	Q11314.14	0/77
				Q11314.18	0/77
				Q11314.14	0/77
			AD7124-4	Q10560.12	0/77
				Q10560.14	0/77
				Q10560.2	0/77
			AD7124-8	Q13197.HA1	0/77
				Q13197.HA2	0/77
				Q13197.HA3	0/77
				Q18619.1.HA	0/77
				Q18619.2.HA	0/77
				Q18619.3.HA	0/77

¹ These samples were subjected to preconditioning at MSL 3 with 3x reflow peak temp of 260°C prior to the start of the stress test.

Package/Assembly Product Characteristics

Table 3: Package/Assembly Product Characteristics - 24-TSSOP_4.4 at ASE (AET)

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data			
		AD5203	AD7176-2	AD8802	AD5203
Generic/Root Part #	AD7124-4	AD5203	AD7176-2	AD8802	AD5203
Package	24-TSSOP_4.4	24-TSSOP_4.4	24-TSSOP_4.4	24-TSSOP_4.4	24-TSSOP_4.4
Body Size (mm)	9.70 x 4.40 x 0.86	7.80 x 4.40 x 1.20	7.80 x 4.40 x 1.15	7.80 x 4.40 x 1.15	7.80 x 4.40 x 1.15
Assembly Location	ASE (AET)	ASE (AET)	ASE (AET)	ASE (AET)	ASE (AET)
MSL/Peak Reflow Temperature(°C)	1 / 260°C	1 / 260°C	1 / 260°C	1 / 260°C	1 / 260°C
Mold Compound	Hitachi CEL 9240HF10AK	Hitachi CEL 9240HF10AK	Hitachi CEL 9240HF10AK	Hitachi CEL 9240HF10AK	Hitachi CEL 9240HF10AK
Die Attach	Hitachi EN 4900GC conductive	Hitachi EN 4900GC conductive	Hitachi EN 4900GC conductive	Hitachi EN 4900GC conductive	Hitachi EN 4900GC conductive
Leadframe Material	Copper	Copper	Copper	Copper	Copper
Lead Finish	100Sn	100Sn	100Sn	100Sn	100Sn
Wire Bond Material/Diameter (mils)	2N Gold / 0.80	2N Gold / 0.80	2N Gold / 0.80	2N Gold / 0.80	2N Gold / 0.80

Package/Assembly Test Results
Table 4: Package/Assembly Test Results - TSSOP_4.4 at ASE (AET)

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
Autoclave (AC) ¹	JESD22-A102	121C 100%RH 33.3 psia, 96 Hours	AD7176-2	Q10541.PC4	0/77
				Q10541.PC5	0/77
				Q10541.PC6	0/77
			AD8802	Q10540.PC4	0/77
				Q10540.PC5	0/77
				Q10540.PC6	0/77
			ADG1212	Q10540.PC1	0/77
				Q10540.PC2	0/77
				Q10540.PC3	0/77
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	AD5203	Q10541.HS3	0/77
			AD8802	Q10540.HS2	0/77
			ADG1212	Q10540.HS1	0/77
Highly Accelerated Temperature and Humidity Stress Test (HAST) ¹	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	AD5203	Q10541.HA7	0/77
				Q10541.HA8	0/77
				Q10541.HA9	0/77
			AD8802	Q10540.HA4	0/77
				Q10540.HA5	0/77
				Q10540.HA6	0/77
			ADG1212	Q10540.HA1	0/77
				Q10540.HA2	0/77
				Q10540.HA3	0/77

Solder Heat Resistance (SHR)	J-STD-020	MSL-1	AD7124-4	Q20189.1.1	0/30
Temperature Cycling (TC) ¹	JESD22-A104	-65°C/+150°C, 500 Cycles	AD5203	Q10541.TC7	0/90
				Q10541.TC8	0/90
				Q10541.TC9	0/90
			AD8802	Q10540.TC4	0/77
				Q10540.TC5	0/77
				Q10540.TC6	0/77
			ADG1212	Q10540.TC1	0/77
				Q10540.TC2	0/77
				Q10540.TC3	0/77

¹ These samples were subjected to preconditioning at MSL 1 with 3x reflow peak temp of 260°C prior to the start of the stress test.

ESD and Latch-Up Test Results

Table 5: ESD Test Result

ESD Model	Generic/Root Part #	Package	ESD Test Spec	RC Network	Highest Pass Level	Class
FICDM	AD7124-4	24-TSSOP_4.4	JS-002	1Ω, Cpkg	±1000V	C3
HBM	AD7124-8	24-TSSOP_4.4	ESDA/JEDEC JS-001	1.5kΩ, 100pF	±4000V	3A

Table 6: Latch Up Test Result

LU Test Spec	Generic/Root Part #	Passing Current	Passing Over-Voltage	Temperature (T _A)	Class
JESD78	AD7124-4	+200mA, -200mA	+5.4V/+5.4V	25°C	I

Approvals

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