



Reliability Report

Report Title: ADG5248F in TSSOP and LFCSP Die
Revision Qualification

Report Number: 20484

Revision: A

Date: 4 October 2023

Summary

This report documents the successful completion of the reliability qualification requirements for the release of the ADG5248F product in a 20-TSSOP_4.4 package and 20 LFCSP. The ADG5248F is an 8:1 and dual 4:1 analog multiplexers and the ADG5248F witches one of eight inputs to a common output.

Die/Fab Product Characteristics

Table 1: Die/Fab Product Characteristics- 0.25um DMOS

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data			
		ADG5412F	ADG5208F	ADHV4702-1	ADG5401F
Generic/Root Part #	ADG5248F	ADG5412F	ADG5208F	ADHV4702-1	ADG5401F
Die Id	8YP42 D	8YP07A	8YP42A	8YR80	8YT24 A
Die Size (mm)	2.64 x 2.64	2.65 x 2.65	2.65 x 2.65	2.70 x 2.70	1.08 x 2.28
Wafer Fabrication Site	ADI Limerick	ADI Limerick	ADI Limerick	ADI Limerick	ADI Limerick
Wafer Fabrication Process	0.25um DMOS	0.25um DMOS	0.25um DMOS	0.25um DMOS	0.25um DMOS
Die Substrate	Si	Si	Si	Si	Si
Metallization / # Layers	AlCu/4	AlCu/4	AlCu/4	AlCu/4	AlCu/4
Polyimide	No	No	No	Yes	No
Passivation	Oxide&Nitride	Oxide&Nitride	Oxide&Nitride	Oxide&Nitride	Oxide&Nitride

Die/Fab Test Results
Table 2: Die/Fab Test Results - 0.25µm DMOS at ADI-Limerick

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
Early Life Failure Rate (ELFR)	MIL-STD-883, M1015	125°C, 48 Hours	ADG5208F	Q11144.EL1a	0/600
				Q11144.EL2a	0/600
			ADG5412F	Q10718.EL1b	0/200
				Q10718.EL1c	0/200
				Q10718.EL2a	0/200
				Q10718.EL2b	0/200
High Temperature Operating Life (HTOL)	JESD22-A108	125°C<Tj<135°C, Biased, 1,000 Hours	ADG5401F	Q13855.HO2	0/77
				Q13855.HO3	0/77
				Q13855.HO4	0/77
			ADG5412F	Q10718.HO1	0/77
				Q10718.HO2	0/77
				Q10718.HOP4	0/77
			ADHV4702-1 ²	Q1304626	0/77
				Q13046.27	0/77
				Q13046.28	0/77
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	ADG5208F	Q11144.HS1	0/45
			ADG5401F	Q13855.HS1	0/77
			ADG5412F	Q11444.HS1	0/77
Highly Accelerated Temperature and Humidity Stress Test (HAST) ¹	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	ADG5412F	Q11444.HA1	0/77
				Q11444.HA2	0/77
				Q11444.HA3	0/77
Highly Accelerated Temperature and Humidity Stress Test (HAST) ²	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	ADHV4702-1	Q13046.4	0/77
				Q13046.5	0/77
				Q13046.6	0/77
			ADG5208F	Q11144.HA1a	0/45
				Q11144.HA1b	0/45
				Q11144.HA2	0/45

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.

² 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 - 20-TSSOP_4.4 at ASE (AET)

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data			
		AD8802	AD7176-2	AD5203	ADG1212
Generic/Root Part #	ADG5248F	AD8802	AD7176-2	AD5203	ADG1212
Package	20-TSSOP_4.4	20-TSSOP_4.4	24-TSSOP_4.4	20-TSSOP_4.4	20-TSSOP_4.4
Body Size (mm)	6.50 x 4.50 x 1.20	6.50 x 4.40 x 1.00	7.80 x 4.40 x 1.15	6.50 x 4.40 x 1.00	6.50 x 4.40 x 1.00
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	Hitachi EN 4900GC	Hitachi EN 4900GC	Hitachi EN 4900GC	Hitachi EN 4900GC
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

Table 3.1: Package/Assembly Product Characteristics - 20-LFCSP at AMKOR (AP3)

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data		
Generic/Root Part #	ADG5248F	ADP1754-1.3V	AD8295	ADG5208F
Package	20-LFCSP	20-LFCSP	16-LFCSP	16-LFCSP
Body Size (mm)	4 x 4 x 0.75	4 x 4 x 0.75	4 x 4 x 0.85	4 x 4 x 0.75
Assembly Location	AMKOR(AP3)	AMKOR(AP3)	AMKOR(AP3)	AMKOR(AP3)
MSL/Peak Reflow Temperature(°C)	3 / 260°C	3 / 260°C	3 / 260°C	3 / 260°C
Mold Compound	Sumitomo G700	Sumitomo G700	Sumitomo G700	Sumitomo G700
Die Attach	Ablestik 8290	Ablestik 8290	Ablestik 8290	Ablestik 8290
Leadframe Material	Copper	Copper	Copper	Copper
Lead Finish	100Sn	100Sn	100Sn	100Sn
Wire Bond Material/Diameter (mils)	2N Gold / 0.80	2N Gold / 1.3	4N Gold / 1	2N Gold / 0.80

Table 3.2: Package/Assembly Product Characteristics - 20-LFCSP at AMKOR (AP3)

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data		
Generic/Root Part #	ADG5248F	AD8426	ADA4558	ADF4002
Package	20-LFCSP	16-LFCSP	20-LFCSP	20-LFCSP
Body Size (mm)	4 x 4 x 0.75	4 x 4 x 0.85	4 x 4 x 0.75	4 x 4 x 0.85
Assembly Location	AMKOR(AP3)	AMKOR(AP3)	AMKOR(AP3)	AMKOR(AP3)
MSL/Peak Reflow Temperature(°C)	3 / 260°C	3 / 260°C	3 / 260°C	3 / 260°C
Mold Compound	Sumitomo G700	Sumitomo G700	Sumitomo G700	Sumitomo G700
Die Attach	Ablestik 8290	Ablestik 8290	Ablestik 8290	Ablestik 8290
Leadframe Material	Copper	Copper	Copper	Copper
Lead Finish	100Sn	100Sn	100Sn	100Sn
Wire Bond Material/Diameter (mils)	2N Gold / 0.80	4N Gold / 1	2N Gold / 1	4N Gold / 1

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	AD5203	Q10541.PC7	0/77
				Q10541.PC8	0/77
				Q10541.PC9	0/77
			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
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	AD5203	Q10541.HS3	0/77
			AD7176-2	Q10541.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
			AD7176-2	Q10541.HA4	0/77
				Q10541.HA6	0/77
				Q10541.HA5	0/77
			ADG1212	Q10540.HA1	0/77
				Q10540.HA2	0/77
				Q10540.HA3	0/77
Solder Heat Resistance (SHR)	J-STD-020	MSL-1	ADG5249F	Q20482.1.SH1	0/30

Temperature Cycling (TC) ¹	JESD22-A104	-65°C/+150°C, 500 Cycles	AD5203	Q10541.TC7	0/77
				Q10541.TC8	0/77
				Q10541.TC9	0/77
			AD7176-2	Q10541.TC4	0/77
				Q10541.TC5	0/77
				Q10541.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.

Table 4.1: Package/Assembly Test Results – LFCSP at AMKOR

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
Autoclave (AC) ¹	JESD22-A102	121C 100%RH 33.3 psia, 96 Hours	ADP1754-1.3V	Q10911.PC1	0/77
				Q10911.PC2	0/77
				Q10911.PC3	0/77
Unbiased HAST (UHST) ²	JESD22-A118	130C 85%RH 33.3 psia, 96 Hours	AD8295	Q11640.UH1	0/77
				Q11640.UH2	0/77
				Q11640.UH3	0/77
			ADF4002	Q11640.UH1	0/77
				Q11640.UH2	0/77
				Q11640.UH3	0/77
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	AD5208F	Q11144.1.HS1	0/45
			AD8295	Q11640.HS1	0/77
			ADF4002	Q11642.HS1	0/77
Highly Accelerated Temperature and Humidity Stress Test (HAST) ¹	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	AD5208	Q11144.1.HA1	0/45
				Q11144.1.HA2	0/45
				Q11144.1.HA3	0/45
			AD8426	Q11640.HA1	0/77
				Q11640.HA2	0/77
				Q11640.HA3	0/77
			ADF4002	Q11642.HA1	0/77
				Q11642.HA2	0/77
				Q11642.HA3	0/77
Solder Heat Resistance (SHR) ²	J-STD-020	MSL-3	ADG5248F	Q20484.1.SH1	0/30

Temperature Cycling (TC) ²	JESD22-A104	-65°C/+150°C, 500 Cycles	AD8295	Q11640.TC1	0/77
				Q11640.TC2	0/77
				Q11640.TC3	0/77
			ADA4558	Q11089.1	0/32
				Q11089.2	0/32
				Q11089.3	0/32
			ADF4002	Q11642.TC1	0/77
				Q11642.TC2	0/77
				Q11642.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.

² 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.

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	ADG5248F	20-TSSOP_4.4	JS-002	1Ω, Cpkg	±500V	C2
		20-LFCSP			±750V	C2
HBM	ADG5248F	20-TSSOP_4.4	ESDA/JEDEC JS-001-2011	1.5kΩ, 100pF	±2500V	2

Table 6: Latch Up Test Result

LU Test Spec	Generic/Root Part #	Passing Current	Passing Over-Voltage	Temperature (T _A)	Class
JESD78	ADG5248F	+100mA, -100mA	+26, -26V	25°C	I

Approvals

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