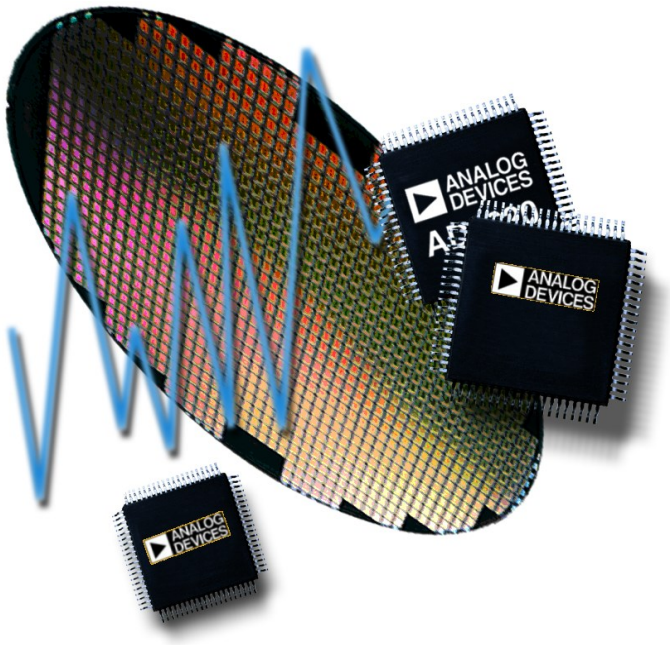

Reliability Report

Report Title: ADUCM430 SSMC Dual Fab Source Qualification

Report Number: 25374

Revision: A

Date: 16 May 2026

Summary

This report documents the successful completion of the reliability qualification requirements for the release of the ADUCM430 product in a 121-CSP_BGA package. The ADUCM430 is a Precision Analog Microcontroller, 12-Bit Analog Input and Output with PMIC and TECC, Arm Cortex-M3 with application to optical networking and higher frequency modules.

Die/Fab Product Characteristics

Table 1.1: Die/Fab Product Characteristics (Die 1) - 0.18um CMOS at SSMC

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data
Generic/Root Part #	ADUCM430	ADUCM430A
Die Id	TMUS86 A-T1	TMUS86 A-T1
Die Size (mm)	3.75 x 3.75	3.75 x 3.75
Wafer Fabrication Site	Systems on Silicon Manufacturing Company Pte. Ltd. (SSMC)	Systems on Silicon Manufacturing Company Pte. Ltd. (SSMC)
Wafer Fabrication Process	0.18um CMOS	0.18um CMOS
Die Substrate	Si	Si
Metallization / # Layers	AlCu/6	AlCu/6
Polyimide	Yes	Yes
Passivation	undoped-oxide/SiN	undoped-oxide/SiN

Table 1.2: Die/Fab Product Characteristics (Die 2/Die 3) - 65nm CMOS at ISSI

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data
Generic/Root Part #	ADUCM430	ADUCM430A
Die Id	IS25LP080D-JWLA3	IS25LP080D-JWLA3
Die Size (mm)	1.61 x 0.94	1.61 x 0.94
Wafer Fabrication Site	Integrated Silicon Solution Inc. (ISSI)	Integrated Silicon Solution Inc. (ISSI)
Wafer Fabrication Process	65nm CMOS	65nm CMOS
Die Substrate	Si	Si
Metallization / # Layers	Proprietary	Proprietary
Polyimide	Proprietary	Proprietary
Passivation	HDPundoped oxide/Oxide&Nitride	HDPundoped oxide/Oxide&Nitride

Die/Fab Test Results

Table 2.1: Die/Fab Test Results (Die 1) - 0.18um CMOS at SSMC

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
Early Life Failure Rate (ELFR)	MIL-STD-883, M1015	125°C, 48 Hours	ADUCM430A	Q22794.1.ELx	0/667
				Q22794.2.ELx	0/667
				Q22794.3.ELx	0/665[2]
High Temperature Operating Life (HTOL) [1]	JESD22-A108	125°C<Tj<135°C, Biased, 1,000 Hours	ADUCM430A	Q22794.1.HO1A	0/45
				Q22794.2.HO2A	0/45
				Q22794.4.HO3C	0/45
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	ADUCM430A	Q22794.1.HT1	0/45
Highly Accelerated Temperature and Humidity Stress Test (HAST)[1]	JESD22-A110	130°C 85%RH 33.3 psia, Biased, 96 Hours	ADUCM430A	Q22794.1.HA1	0/45
				Q22794.2.HA2	0/45
				Q22794.3.HA3	0/45

[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.
[2] Sample size is reduced due to invalid EOS failure based on the findings.

Table 2.2: Die/Fab Test Results (Die 2/Die 3) - 65nm CMOS at ISSI

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
High Temperature Operating Life (HTOL)[1]	JESD22-A108	125°C<Tj<135°C, Biased, 1,000 Hours	ADUCM430A	Q22794.1.HO1A	0/45
				Q22794.2.HO2A	0/45
				Q22794.4.HO3C	0/45
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	ADUCM430A	Q22794.1.HT1	0/45

[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 - 121-CSP_BGA at STATS (SC3)

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data		
Generic/Root Part #	ADUCM430	ADUCM430IE	ADUCM435E	ADUCM435IES
Package	121-CSP_BGA	121-CSP_BGA	72-CSP_BGA	81-CSP_BGA
Body Size (mm)	5.00 x 5.00 x 1.00	5.00 x 5.00 x 1.00	4.00 x 4.00 x 0.89	4.50 x 4.50 x 1.03
Assembly Location	STATS (SC3)	STATS (SC3)	STATS (SC3)	STATS (SC3)
MSL/Peak Reflow Temperature(°C)	3 / 260°C	3 / 260°C	3 / 260°C	3 / 260°C
Mold Compound	Kyocera KE G1250LKDS-U2 CL20	Kyocera KE G1250LKDS-U2 CL20	Kyocera KE G1250LKDS-U2 CL20	Kyocera KE G1250LKDS-U2 CL20
Die Attach/Underfill/TIM	Ablestik 2025D non-conductive/Hitachi HR 5104 film non-conductive	Ablestik 2025D non-conductive/Hitachi HR 5104 film non-conductive	Ablestik 2025D non-conductive/Hitachi HR 5104 film non-conductive	Ablestik 2025D non-conductive / Hitachi HR 5104 film non-conductive
Leadframe Material	BT	BT	BT	BT
Lead Finish	96.5Sn_3.0Ag_0.5Cu	96.5Sn_3.0Ag_0.5Cu	96.5Sn_3.0Ag_0.5Cu	96.5Sn_3.0Ag_0.5Cu
Wire Bond Material/Diameter (mils)	2N Gold / 1.00	2N Gold / 0.80	2N Gold / 0.80	2N Gold / 0.80

Package/Assembly Test Results

Table 4: Package/Assembly Test Results - CSP_BGA at STATS (SC3)

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	ADUCM430	Q21714.1.HS1	0/32
			ADUCM435IES	Q22335.1.HS1	0/45
Highly Accelerated Temperature and Humidity Stress Test (HAST)[1]	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	ADUCM430	Q21714.1.HA1	0/32
				Q21714.2.HA2B	0/45
				Q21714.3.HA3	0/32
Solder Heat Resistance (SHR)	J-STD-020	MSL-3	ADUCM430IE	Q23380.1.SH1	0/32
Temperature Cycling (TC)[1]	JESD22-A104	-65°C/+150°C, 500 Cycles	ADUCM435E	Q20555.1.TC1	0/32
				Q20555.2.TC2	0/32
				Q20555.3.TC3	0/32
			ADUCM430	Q21714.1.TC1	0/32
				Q21714.2.TC2	0/32
				Q21714.3.TC3	0/32
			ADUCM435IES	Q22335.1.TC1	0/45
				Q22335.1.TC3	0/45
				Q22335.2.TC2	0/45
Unbiased HAST (UHAST)[1]	JESD22-A118	130°C 85%RH 33.3 psia, 96 Hours	ADUCM430	Q21714.1.UH1	0/32
				Q21714.2.UH2	0/32
				Q21714.3.UH3	0/32
			ADUCM435E	Q20555.1.UH1	0/32
				Q20555.2.UH2	0/32
				Q20555.3.UH3	0/32
			ADUCM435IES	Q22335.1.UH1	0/45
				Q22335.1.UH3	0/45
				Q22335.2.UH2	0/45

[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.

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	ADUCM430	121-CSP_BGA	JS-002	1Ω, Cpkg	±1250V	C3
HBM	ADUCM430	121-CSP_BGA	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	ADUCM430	+150mA, -150mA	+5.4V	125°C	II

Approvals

Reliability Engineer: Aldrin Cerezo