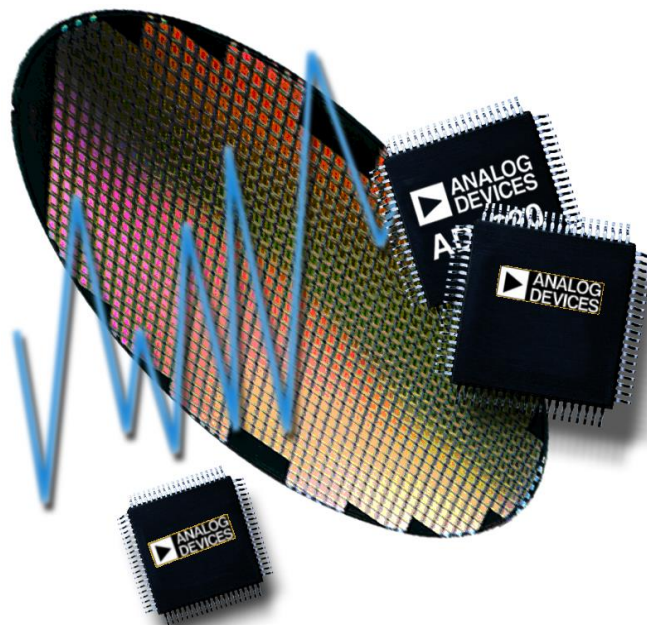




Reliability Report

Report Title:	AD7606B Die Revision TMLC81 B Qualification
Report Number:	23696
Revision:	A
Date:	13 July 2025

Summary

This report documents the successful completion of the reliability qualification requirements for the release of the AD7606B TMLC81 B die revision in a 64-LQFP package.

The AD7606B is a 16-bit, simultaneous sampling, analog-to-digital data acquisition system (DAS) with eight channels. Each channel contains analog input clamp protection, a programmable gain amplifier (PGA), a low-pass filter (LPF), and a 16-bit successive approximation register (SAR), analog-to-digital converter (ADC).

Die/Fab Product Characteristics

Table 1: Die/Fab Product Characteristics- 0.18um CMOS

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data				
Generic/Root Part #	AD7606B	AD7606B	AD7606C-18	AD7616	ADA4351-2	AD4170
Die Id	TMLC81 B	TMLC81 A	TMMJ64 B	TMGN47	TMPG94 A	TMPA37 A
Die Size (mm)	5.97 x 5.97	5.97 x 5.97	5.97 x 5.97	5.70 x 5.70	2.04 x 2.04	2.65 x 4.58
Wafer Fabrication Site	TSMC Fab-8B	TSMC Fab-8B	TSMC Fab-8B	TSMC Fab-8B	TSMC Fab-8B	TSMC Fab-8B
Wafer Fabrication Process	0.18um CMOS	0.18um CMOS	0.18um CMOS	0.18um CMOS	0.18um CMOS	0.18um CMOS
Die Substrate	Si	Si	Si	Si	Si	Si
Metallization / # Layers	AlCu(0.5%)/5	AlCu(0.5%)/5	AlCu(0.5%)/5	AlCu/5	AlCu(0.5%)/5	AlCu(0.5%)/5
Polyimide	Yes	Yes	Yes	Yes	Yes	No
Passivation	undoped-oxide/SiN	undoped-oxide/SiN	undoped-oxide/SiN	undoped-oxide/SiN	undoped-oxide/SiN	undoped-oxide/SiN

Die/Fab Test Results

Table 2: Die/Fab Test Results - 0.18μm CMOS at TSMC Fab-8B

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
Early Life Failure Rate (ELFR)	MIL-STD-883, M1015	125°C, 48 Hours	AD7616	Q11187.EL1X	0/667
				Q11187.EL2X	0/667
				Q11187.EL3X	0/667
				Q11187.4	0/30
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	AD7606B	Q13259.10	0/45
				Q14040.1	0/32
			AD7616	Q11187.5	0/32
			AD4170	Q18320.1.3	0/50
Highly Accelerated Temperature and Humidity Stress Test (HAST) ¹	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	AD7606B	Q13259.6	0/32
				Q13259.8	0/32
				Q14040.4	0/32
			AD7616	Q11187.10	0/32
				Q11187.14	0/32
			ADA4351-2	Q20704.1.HA1	0/77
				Q20704.2.HA2	0/77
Temperature Humidity Bias (THB) ¹	JESD22-A101	85°C, 85%RH, Biased, 1,000 Hours	AD7616	Q20704.3.HA3	0/77
				Q11187.6	0/32
High Temperature Operating Life (HTOL)	JESD22-A108	125°C<Tj<135°C, Biased, 1,000 Hours	AD4170	Q17385.1.2	0/50
				Q18320.1.1	0/50
				Q18320.2.1	0/50
				Q18320.3.1	0/50
			AD7606B	Q13259.1	0/45
				Q13259.2	0/45
				Q14040.2	0/32
			AD7606C-18	Q17644.1.HO1	0/45
			AD7616	Q11187.1	0/40
				Q11187.4	0/30
			ADA4351-2	Q20704.1.HO1	0/77
				Q20704.2.HO2	0/77

				Q20704.3.H03	0/77
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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 - 64-LQFP at STATS (SC3)

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data				
Generic/Root Part #	AD7606B	AD7606B	AD45336	ADAU1966	ADUC7033	AD8450
Package	64-LQFP	64-LQFP	100-LQFP	80-LQFP	48-LQFP	80-LQFP
Body Size (mm)	10.00 x 10.00 x 1.40	10.00 x 10.00 x 1.40	14.00 x 14.00 x 1.40	14.00 x 14.00 x 1.40	7.00 x 7.00 x 1.40	14.00 x 14.00 x 1.40
Assembly Location	STATS (SC3)	STATS (SC3)	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	3 / 260°C	3 / 260°C
Mold Compound	Sumitomo G700E	Sumitomo G700E	Sumitomo G700E	Sumitomo G700E	Sumitomo G700E	Sumitomo G700E
Die Attach	Ablestik 3230	Ablestik 3230	Ablestik 3230	Ablestik 3230	Loctite QMI536 / Ablestik 3230	Ablestik 3230
Leadframe Material	Copper	Copper	Copper	Copper	Copper	Copper
Lead Finish	100Sn	100Sn	100Sn	100Sn	100Sn	100Sn
Wire Bond Material/Diameter (mils)	MKE R 2N Gold / 0.80	MKE R 2N Gold / 0.80	MKE R 2N Gold / 0.80	Gold MKE-R / 1.0	Gold MKE-UB / 1.0	Gold MKE-R / 0.80

Package/Assembly Test Results

Table 4: Package/Assembly Test Results - LQFP 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	AD45336	Q22318.1.HT1	0/50
				Q22318.2.HT2	0/50
				Q22318.3.HT3	0/50
			AD7606B	Q13259.10	0/45
				Q14040.1	0/32
			ADAU1966	Q21077.1.HS2_RES_EXP	0/77
			ADUC7033	Q12274.HS1	0/77
Highly Accelerated Temperature and Humidity Stress Test (HAST)	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	AD8450	Q13813.HA2a	0/30
				Q13813.HA2b	0/22
Highly Accelerated Temperature and Humidity Stress Test (HAST) ¹	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	AD45336	Q22318.1.HA1	0/37
				Q22318.2.HA2	0/37
				Q22318.3.HA3	0/37
				Q22318.1.HA4	0/40
				Q22318.2.HA5	0/40
				Q22318.2.HA5.B	0/20
				Q22318.3.HA6	0/40
			AD7606B	Q14040.4	0/32
				Q13259.6	0/32
				Q13259.8	0/32
			ADAU1966	Q21077.1.HA1_RES_EXP	0/77
				Q21077.2.HA2_RES_EXP	0/77
				Q21077.3.HA3_RES_EXP	0/77
				Q21077.4.HA2R_RES_EXP	0/77
Solder Heat Resistance (SHR)	J-STD-020	MSL-3	AD45336	Q22318.1.SH1	0/16
				Q22318.2.SH2	0/16
				Q22318.3.SH3	0/16
			AD7606B	Q13259.4	0/11
				Q13259.9	0/11
				Q13259.11	0/11
			AD7616	Q21492.87	0/30

			AD8113	Q18641.110	0/30
			AD8197	Q20744.72	0/30
			ADAU1966	Q21077.1.SH1_RES_EXP	0/15
				Q21077.2.SH2_RES_EXP	0/15
				Q21077.3.SH3_RES_EXP	0/15
Temperature Cycling (TC) ¹	JESD22-A104	-40/125, Soak3, 10-14C/min, 1,000 Cycles	AD45336	Q22318.1.TC1	0/37
				Q22318.2.TC2	0/37
				Q22318.3.TC3	0/37
		-65°C/+150°C, 500 Cycles	AD7606B	Q13259.3	0/45
				Q13259.5	0/45
				Q13259.7	0/45
			AD7616	Q21492.85	0/77
			AD8113	Q18641.108	0/50
			AD8197	Q20744.70	0/77
			ADAU1966	Q21077.1.TC1_RES_EXP	0/77
				Q21077.2.TC2_RES_EXP	0/77
				Q21077.3.TC3_RES_EXP	0/77
			ADUC7033	Q12274.TC1	0/77
				Q12274.TC2	0/77
				Q12274.TC3	0/77
Unbiased HAST (UHST) ¹	JESD22-A118	130C 85%RH 33.3 psia, 96 Hours	AD45336	Q22318.1.UH1	0/37
				Q22318.2.UH2	0/37
				Q22318.3.UH3	0/37
			AD7616	Q21492.860.	0/77
			AD8450	Q13813.UH4	0/77
				Q13813.UH5	0/77
				Q13813.UH6	0/77
			ADAU1966	Q21077.1.UH1_RES_EXP	0/77
				Q21077.2.UH2_RES_EXP	0/77
				Q21077.3.UH3_RES_EXP	0/77
			ADUC7033	Q12274.UH1	0/77
				Q12274.UH2	0/77
				Q12274.UH3	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.

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	AD7606B	64-LQFP	JS-002	1Ω, Cpkg	±500V	C2a
HBM	AD7606B	64-LQFP	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
JEDEC Standard JESD78	AD7606B	+100mA, -100mA	+10V	25°C	I

Approvals

Reliability Engineer: Ronnel Alota