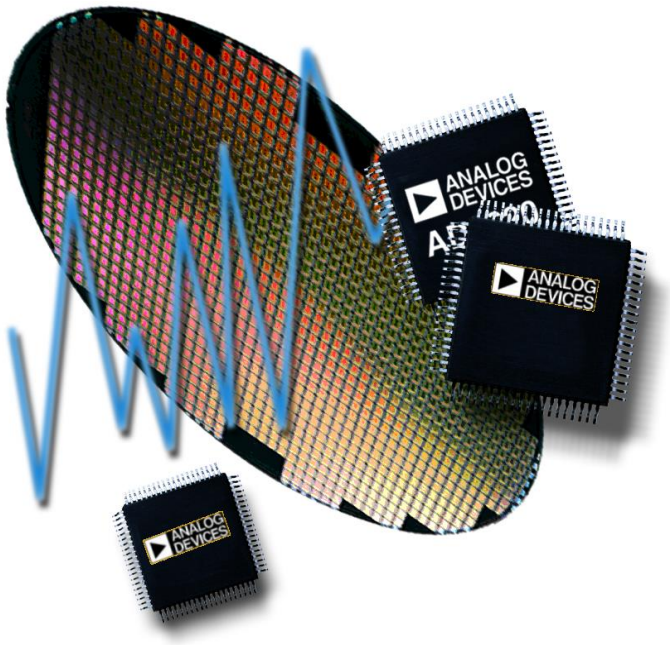

Reliability Report

Report Title: Qualification of ADI Camas Wafer Fab 6um Bipolar Process for Non-Automotive Products

Report Number: 24360

Revision: B

Date: 28 July 2025

Summary

This report documents the reliability qualification requirements for the release of the 6um Bipolar wafer fabrication process for non-automotive products at Analog Devices Camas Wafer Fabrication Facility. The products listed below were selected to cover the technology being released.

The OP07 has a very low input offset voltage (75 µV maximum for OP07E) that is obtained by trimming at the wafer stage. These low offset voltages generally eliminate any need for external nulling.

The REF43 is a low power precision reference providing a stable 2.5 V output independent of variations in supply voltage, load conditions or ambient temperature. It is suitable as a reference level for 8-, 10- and 12-bit data acquisition systems, or wherever a stable, known voltage is required.

Die/Fab Product Characteristics

Table 1: Die/Fab Product Characteristics – 6um Bipolar

Product Characteristics	Product(s) to be qualified	
Generic/Root Part #	OP07	REF43
Die Id	6WOP77YV*01 A	6WREF43RV*01 A
Die Size (mm)	1.43 x 2.35	2.13 x 1.65
Wafer Fabrication Site	ADI Camas	ADI Camas
Wafer Fabrication Process	6um Bipolar	6um Bipolar
Die Substrate	Si	Si
Metallization / # Layers	AlCu(0.5%)/1	AlCu(1.0%)/1
Polyimide	No	Yes
Passivation	doped-oxide/SiN	doped-oxide/SiN

Die/Fab Test Results

Table 2: Die/Fab Test Results – 6um Bipolar at ADI Camas

Test Name	AEC#	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
High Temperature Operating Life (HTOL)[1]	B1	JESD22-A108	135°C<Tj<150°C, 1,000 Hours	OP07	Q21307.1.HO1_RES	0/77
				REF43	Q21263.1.HO1_RES	0/77
					Q21263.2.HO2_RES	0/77
					Q21263.3.HO3_RES	0/77
High Temperature Storage Life (HTSL)	A6	JESD22-A103	150°C, 1,000 Hours	OP07	Q21307.1.HS1_RES	0/77
				REF43	Q21263.1.HS1_RES	0/77
Highly Accelerated Temperature and Humidity Stress Test (HAST)[1]	A2	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	OP07	Q21307.1.HA2_RES	0/77
				REF43	Q21263.1.HA1_RES	0/77
					Q21263.2.HA2_RES	0/77
					Q21263.3.HA3_RES	0/77
Unbiased HAST (UHST)[1]	A3	JESD22-A118	130C 85%RH 33.3 psia, 96 Hours	OP07	Q21307.1.UH1_RES	0/77
				REF43	Q21263.1.UH1_RES	0/77
					Q21263.2.UH2_RES	0/77
					Q21263.3.UH3_RES	0/77
Temperature Cycling (TC)[1]	A4	JESD22-A104	-65°C/+150°C, 500 Cycles	OP07	Q21307.1.TC1_RES	0/77
				REF43	Q21263.1.TC1_RES	0/77
					Q21263.2.TC2_RES	0/77
					Q21263.3.TC3_RES	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.

Package/Assembly Product Characteristics

Table 3.1: Package/Assembly Product Characteristics - SOIC_N at AMKOR (AP1)

Product Characteristics	Product(s) to be qualified
Generic/Root Part #	OP07
Package	8-SOIC_N
Body Size (mm)	5.00 x 4.00 x 1.50
Assembly Location	AMKOR (AP1)
MSL/Peak Reflow Temperature(°C)	1/ 260
Mold Compound	Sumitomo G600
Die Attach/Underfill/TIM	Ablestik 84-1 LMISR4 conductive
Leadframe Material	Copper
Lead Finish	100Sn
Wire Bond Material/Diameter (mils)	2N Gold / 1.20

Table 3.2: Package/Assembly Test Results - SOIC_N at ASE (AET)

Product Characteristics	Product(s) to be qualified
Generic/Root Part #	REF43
Package	8-SOIC_N
Body Size (mm)	5.00 x 4.00 x 1.75
Assembly Location	ASE (AET)
MSL/Peak Reflow Temperature(°C)	1 / 260
Mold Compound	Hitachi CEL 9240HF10AK
Die Attach/Underfill/TIM	Hitachi EN4900GC conductive
Leadframe Material	Copper
Lead Finish	100Sn
Wire Bond Material/Diameter (mils)	Tanaka GPG 2N Gold / 1.20

Package/Assembly Test Results

Table 4: Package/Assembly Test Results - SOIC_N

Test Name		Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
High Temperature Storage Life (HTSL)	A6	JESD22-A103	150°C, 1,000 Hours	OP07	Q21307.1.HS1_RES	0/77
				REF43	Q21263.1.HS1_RES	0/77
Solder Heat Resistance (SHR)[1]	A1	J-STD-020	MSL-1	OP07	Q21307.1.SH1_RES	0/11
				REF43	Q21263.1.SH1_RES	0/11
					Q21263.2.SH2_RES	0/11
					Q21263.3.SH3_RES	0/11
Highly Accelerated Temperature and Humidity Stress Test (HAST)[1]	A2	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	OP07	Q21307.1.HA2_RES	0/77
				REF43	Q21263.1.HA1_RES	0/77
					Q21263.2.HA2_RES	0/77
					Q21263.3.HA3_RES	0/77
Unbiased HAST (UHST)[1]	A3	JESD22-A118	130C 85%RH 33.3 psia, 96 Hours	OP07	Q21307.1.UH1_RES	0/77
				REF43	Q21263.1.UH1_RES	0/77
					Q21263.2.UH2_RES	0/77
					Q21263.3.UH3_RES	0/77
Temperature Cycling (TC)[1]	A4	JESD22-A104	-65°C/+150°C, 500 Cycles	OP07	Q21307.1.TC1_RES	0/77
				REF43	Q21263.1.TC1_RES	0/77
					Q21263.2.TC2_RES	0/77
					Q21263.3.TC3_RES	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	OP07	8-SOIC_N	JS-002	1Ω, Cpkg	±1250V	C3
	REF43	8-SOIC_N	JS-002	1Ω, Cpkg	±1000V	C3
HBM	OP07	8-SOIC_N	JS-001	1.5kΩ, 100pF	±500V	1B
	REF43	8-SOIC_N	JS-001	1.5kΩ, 100pF	±500V	1B

Table 6: Latch Up Test Result

LU Test Spec	Generic/Root Part #	Passing Current	Passing Over-Voltage	Temperature (T_A)	Class
JESD78	OP07	+200mA, -200mA	+27V	25°C	I
JESD78	REF43	+200mA, -200mA	+60V	25°C	I

Approvals

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