PCN # 2275A

DATE: August 14, 2023

EXPECTED PCN SHIP DATE: August 14, 2023

Quality Assurance
160 Rio Robles
San Jose, CA 95134

www.maximintegrated.com

☐ **PROCESS CHANGE NOTICE**

☒ **PRODUCT CHANGE NOTICE**

ANALOG DEVICES HEREBY ISSUES NOTIFICATION OF CHANGE THAT MAY AFFECT THE FOLLOWING CATEGORIES:

☐ DESIGN	☒ WAFER FAB	☐ ASSEMBLY	☐ TEST	☐ ELEC/MECH SPECS

AFFECTED PRODUCT:

Ordering P/N: (See PN listing XLS in PCN ZIP file)

CHANGE FROM: -	CHANGE TO: -
Transfer of the fabrication location for the final top two copper metal layers for ADI commercial devices in MBiC3 (Mobile BiCMOS version 3.0) process. Current processing at Analog Devices Beaverton/USA	New processing location at Analog Devices Limerick/Ireland

JUSTIFICATION: -

The location change to Analog Devices Limerick/Ireland is necessary to ensure Manufacturing Efficiency.

Notes:

1. The fab location of the wafer front-end processing is unchanged.
2. There are no changes to materials, film thicknesses, or critical dimensions.
3. There are no datasheet changes for these products.
4. No Changes to Form/FIT/Function, or Reliability and Quality.

Analog Devices Limerick Qualification report is attached (ref. RQR43467A)

TRACEABILITY: Analog Device maintains full traceability by device marking, packaging labels and shipment documents.

Analog Devices's Change Notification System is designed to keep our customer base apprised of major product, manufacturing, or facility improvements.

Nasser AliChaouche / PCN Coordinator

For further information, please contact either of the people listed below.

Contact your local Analog Devices Company Representative or Nasser AliChaouche, PCN Coordinator
408-601-5660 / pcn.coordinator@maximintegrated.com

Affected product numbers	Customer part number	PCN Proposed Ship Date
806-0713-21+		14-AUG-2023
806-0713-21+T		14-AUG-2023
806-0713-91		14-AUG-2023
806-0717-23+		14-AUG-2023
806-0717-23+T		14-AUG-2023
806-0725-21+		14-AUG-2023
806-0725-21+T		14-AUG-2023
806-0726-21+		14-AUG-2023
806-0726-21+T		14-AUG-2023
806-0727-20+		14-AUG-2023
806-0727-20+T		14-AUG-2023
806-0727-90		14-AUG-2023
MAX12005ETM+		14-AUG-2023
MAX12005ETM+T		14-AUG-2023
MAX14950CTO+		14-AUG-2023
MAX14954ETO+		14-AUG-2023
MAX14966EWT+		14-AUG-2023
MAX14966EWT+T		14-AUG-2023
MAX14970ETP+		14-AUG-2023
MAX14970ETP+T		14-AUG-2023
MAX19791ETX+		14-AUG-2023
MAX19791ETX+T		14-AUG-2023
MAX19793ETX+		14-AUG-2023
MAX19794ETX+		14-AUG-2023
MAX19794ETX+T		14-AUG-2023
MAX2064ETM+		14-AUG-2023
MAX2064ETM+T		14-AUG-2023
MAX2090ETP+		14-AUG-2023
MAX2090ETP+T		14-AUG-2023
MAX2091ETP+		14-AUG-2023
MAX2091ETP+T		14-AUG-2023
MAX2092ETP+		14-AUG-2023
MAX2092ETP+T		14-AUG-2023
MAX2112CTI+		14-AUG-2023
MAX2112CTI+T		14-AUG-2023
MAX2112ETI+		14-AUG-2023
MAX2112ETI+T		14-AUG-2023
MAX2120CTI+		14-AUG-2023
MAX2120CTI+T		14-AUG-2023
MAX2121BETI+		14-AUG-2023
MAX2121BETI+T		14-AUG-2023
MAX2121ETI+		14-AUG-2023
MAX2121ETI+T		14-AUG-2023
MAX2135AE/W+CL8		14-AUG-2023
MAX2135AETN+		14-AUG-2023
MAX2135AETN+T		14-AUG-2023

MAX2137ETN+		14-AUG-2023
MAX2170ETL+		14-AUG-2023
MAX2170ETL+T		14-AUG-2023
MAX2172ETL+		14-AUG-2023
MAX2172ETL+C8S		14-AUG-2023
MAX2172ETL+T		14-AUG-2023
MAX2172ETL+TW		14-AUG-2023
MAX2550ETN+		14-AUG-2023
MAX2550ETN+T		14-AUG-2023
MAX2551ETN+		14-AUG-2023
MAX2551ETN+T		14-AUG-2023
MAX2552ETN+		14-AUG-2023
MAX2553ETN+		14-AUG-2023
MAX2553ETN+T		14-AUG-2023
MAX2612ETA+		14-AUG-2023
MAX2612ETA+T		14-AUG-2023
MAX2613ETA+		14-AUG-2023
MAX2613ETA+T		14-AUG-2023
MAX2614ETA+		14-AUG-2023
MAX2614ETA+T		14-AUG-2023
MAX2615ETA+		14-AUG-2023
MAX2615ETA+T		14-AUG-2023
MAX2616ETA+		14-AUG-2023
MAX2616ETA+T		14-AUG-2023
MAX2634AXT+		14-AUG-2023
MAX2634AXT+T		14-AUG-2023
MAX2657EWT+		14-AUG-2023
MAX2657EWT+T		14-AUG-2023
MAX2658EWT+		14-AUG-2023
MAX2658EWT+T		14-AUG-2023
MAX2659ELT+		14-AUG-2023
MAX2659ELT+T		14-AUG-2023
MAX2667EWT+		14-AUG-2023
MAX2667EWT+T		14-AUG-2023
MAX2674EWT+		14-AUG-2023
MAX2674EWT+T		14-AUG-2023
MAX2676EWT+		14-AUG-2023
MAX2676EWT+T		14-AUG-2023
MAX2686EWS+		14-AUG-2023
MAX2686EWS+T		14-AUG-2023
MAX2686LEWS+		14-AUG-2023
MAX2686LEWS+T		14-AUG-2023
MAX2688EWS+		14-AUG-2023
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MAX2693LEWS+T		14-AUG-2023
MAX2694EWS+		14-AUG-2023
MAX2694EWS+T		14-AUG-2023
MAX2769CETI+		14-AUG-2023
MAX2769CETI+T		14-AUG-2023
MAX2769ETI+		14-AUG-2023
MAX2769ETI+T		14-AUG-2023
MAX2771C/D+		14-AUG-2023
MAX2771ETI+		14-AUG-2023
MAX2771ETI+T		14-AUG-2023
MAX2830ETM+		14-AUG-2023
MAX2830ETM+T		14-AUG-2023
MAX2831ETM+		14-AUG-2023
MAX2831ETM+T		14-AUG-2023
MAX2832ETM+		14-AUG-2023
MAX2832ETM+CFK		14-AUG-2023
MAX2832ETM+T		14-AUG-2023
MAX2832ETM+TCFK		14-AUG-2023
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MAX2837ETM+T		14-AUG-2023
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MAX2850ITK+T		14-AUG-2023
MAX2851ITK+		14-AUG-2023
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MAX2870ETJ+T		14-AUG-2023
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MAX2871ETJ+T		14-AUG-2023
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MAX3518ETP+T		14-AUG-2023
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MAX3520ETP+T		14-AUG-2023
MAX3521ETP+		14-AUG-2023
MAX3521ETP+T		14-AUG-2023
MAX3798ETJ+		14-AUG-2023
MAX3798ETJ+T		14-AUG-2023
MAX3799ETJ+		14-AUG-2023
MAX3799ETJ+T		14-AUG-2023
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MAX3945ETE+T		14-AUG-2023

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MAX3946ETG+T		14-AUG-2023
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MAX3949ETE+T		14-AUG-2023
MAX3987ETM+		14-AUG-2023
MAX3997ETM+		14-AUG-2023
MAX3997ETM+CCP		14-AUG-2023
MAX3997ETM+T		14-AUG-2023
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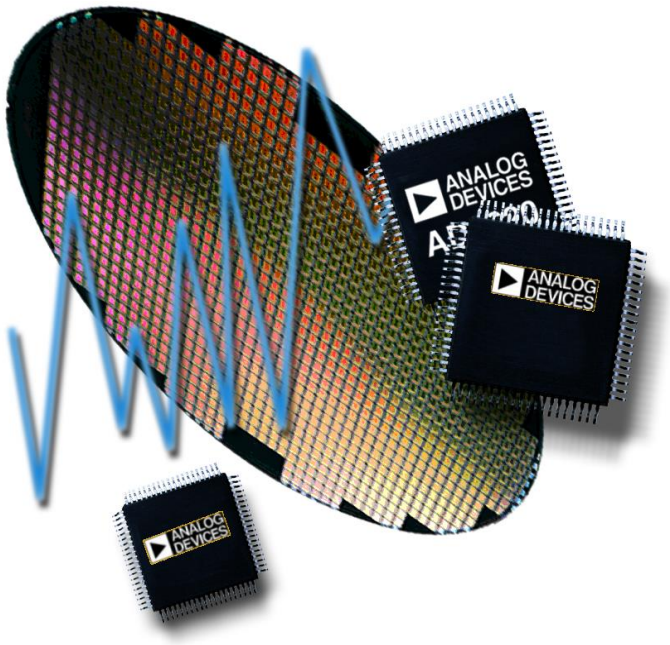
MAX40025AAWT+T		14-AUG-2023
MAX40025CAWT+		14-AUG-2023
MAX40025CAWT+T		14-AUG-2023
MAX4951CCTP+		14-AUG-2023
MAX4951CCTP+T		14-AUG-2023



Reliability Report

Report Title: MAX2172 Automotive Grade 3 Qualification

Report Number: 43467

Revision: A

Date: 8 August 2023

Summary

This report documents the successful completion of the reliability qualification requirements for the release of the MAX2172. The MAX2172 is a direct-conversion to low-IF tuner for digital audio broadcast in a 40 TQFN-EP 6x6mm package.

AECQ100 Qualification Test Methods and Summary

AEC Test Group	AEC Stress Test Name	Abbreviation	AEC Test#	Reference
Group A ACCELERATED ENVIRONMENT STRESS TESTS	Preconditioning	PC	A1	Table 2, Table 4
	Temperature Humidity Bias or Biased-HAST	THB or HAST	A2	
	Autoclave or Unbiased HAST or Temperature Humidity (without Bias)	AC, UHST, or TH	A3	
	Temperature Cycle	TC	A4	
	Power Temperature Cycling	PTC	A5	
	High Temperature Storage Life	HTSL	A6	
Group B ACCELERATED LIFETIME SIMULATION TESTS	High Temperature Operating Life	HTOL	B1	Table 2, Table 4
	Early Life Failure Rate	ELFR	B2	
	NVM Endurance, Data Retention, and Operational Life	EDR	B3	
Group C PACKAGE ASSEMBLY INTEGRITY TESTS	Wire Bond Shear	WBS	C1	• Test C2 (and C1 for Cu Wire) are shown in Table 4. • Tests C3-6 are qualified and controlled with inline monitors and may be viewed on-site at Analog Devices.
	Wire Bond Pull Strength	WBP	C2	
	Solderability	SD	C3	
	Physical Dimensions	PD	C4	
	Solder Ball Shear	SBS	C5	
	Lead Integrity	LI	C6	
Group D DIE FABRICATION RELIABILITY TESTS	Electromigration	EM	D1	Die Fabrication Reliability data may be viewed on-site at Analog Devices.
	Time Dependent Dielectric Breakdown	TDDB	D2	
	Hot Carrier Injection	HCI	D3	
	Negative Bias Temperature Instability	BTI	D4	
	Stress Migration	SM	D5	
Group E ELECTRICAL VERIFICATION TESTS	Pre- and Post-Stress Electrical Test	TEST	E1	Table 5, Table 6
	Electrostatic Discharge Human Body Model	HBM	E2	
	Electrostatic Discharge Charged Device Model	CDM	E3	
	Latch-Up	LU	E4	
	Electrical Distributions	ED	E5	• For Tests E5, E6 and E7, ADI New Product Yield Analysis Testing Guidelines meet AEC Q100 requirements. • Results for Tests E7-E11 are available as applicable on a case by case basis. • Test E12 results may be viewed on-site at Analog Devices
	Fault Grading	FG	E6	
	Characterization	CHAR	E7	
	Electromagnetic Compatibility	EMC	E9	
	Short Circuit Characterization	SC	E10	
	Soft Error Rate	SER	E11	
	Lead (Pb) Free	LF	E12	
Group F DEFECT SCREENING TESTS	Process Average Test	PAT	F1	ADI New Product Yield Analysis Testing Guidelines meet AECQ100 Requirements.
	Statistical Bin/Yield Analysis	SBA	F2	
Group G CAVITY PACKAGE INTEGRITY TESTS	Mechanical Shock	MS	G1	< Applicable only for Cavity-Packages>
	Variable Frequency Vibration	VFV	G2	
	Constant Acceleration	CA	G3	
	Gross/Fine Leak	GFL	G4	
	Package Drop	DROP	G5	
	Lid Torque	LT	G6	
	Die Shear	DS	G7	
	Internal Water Vapor	IWV	G8	

Table 1: Die/Fab Product Characteristics 0.35um SiGe BiCMOS at Epson (ADLK Backend Only)

Product Characteristic	Product(s) to be Qualified	Product(s) used for Substitution Data
Generic/Root Part #	MAX2172	MAX40661
Die Id	WG56A-2B	OZ62A-1B
Die Size (mm)	2.33 x 2.15	1.50 x 1.68
Wafer Fabrication Site	Epson (ADLK Cu Backend Only)	Epson (ADLK Cu Backend Only)
Wafer Fabrication Process	0.35um SiGe BiCMOS	0.35um SiGe BiCMOS
Die substrate	Si	Si
Metallization/# layers	AlCu / 4	AlCu / 4
Polyimide	No	No
Passivation	BCB	BCB

Table 2: Die/Fab Test Results 0.35um SiGe BiCMOS at Epson (ADLK Backend Only)

Test Name	AEC #	Spec	Conditions	Generic/Root Part #	Lot #	Fails/SS	eTest Temp
Preconditioning[1]	A1	J-STD-020 JESD22-A113	MSL-1	MAX2172	R43467A	0/276	R
				MAX40661	R43465A	0/231	R
					R43465B	0/231	R
BHAST[1]	A2	JESD22-A110	130°C, 85%RH, Biased, 96 Hours	MAX2172	R43467A	0/77	RH
				MAX40661	R43465A	0/77	RH
					R43465B	0/77	RH
UHAST[1]	A3	JESD22-A118	130°C, 85%RH, Unbiased, 96 Hours	MAX2172	R43467A	0/77	R
				MAX40661	R43465A	0/77	R
					R43465B	0/77	R
Temperature Cycle[1]	A4	JESD22-A104	-65°C/+150°C, 500 Cycles	MAX2172	R43467A	0/77	RH
				MAX40661	R43465A	0/77	RH
					R43465B	0/77	RH
High Temperature Storage Life (HTSL)	A6	JESD22-A103	150°C, 1000 Hours	MAX2172	R43467A	0/45	RH
High Temperature Operating Life (HTOL)	B1	JESD22-A108	Tjmax<150°C, Biased, 1000 Hours, TA 125C	MAX2172	R43467A	0/77	RHC
				MAX40661	R43465A	0/77	RHC
					R43465B	0/77	RHC
Early Life Failure Rate (ELFR)	B2	AEC-Q100-008	Tjmax<150°C, Biased, 48 Hours, TA 125C	MAX2172	R43467A	0/800	RH
				MAX40661	R43465A	0/800	RH
					R43465B	0/800	RH

[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 3: Package/Assembly Product Characteristics TQFN at ASECL

Product Characteristic	Product(s) to be Qualified	Product(s) used for Substitution Data
Generic/Root Part #	MAX2172	MAX9296A
Package	40 TQFN-EP	48 TQFN-EP
Body Size (mm)	6.00 x 6.00 x 0.75	7.00 x 7.00 x 0.75
Assembly Location	ASECL	ASECL
MSL/Peak Reflow Temperature (°C)	1 / 260°C	1 / 260°C
Mold Compound	Sumitomo G700LA	Sumitomo G700LA
Die Attach/Underfill/TIM	Hitachi EN4900G	Hitachi EN4900G
Leadframe Material	Copper	Copper
Lead Finish	Matte Sn	Matte Sn
Wire Bond Material/Diameter (mils)	Au / 1.0	Au / 1.0

Table 4: Package/Assembly Test Results TQFN-EP at ASECL

Test Name	AEC #	Spec	Conditions	Generic/Root Part #	Lot #	Fails/SS	eTest Temp
Preconditioning[1]	A1	J-STD-020 JESD22-A113	MSL-1	MAX9296A	R29330A	0/231	R
					R29330B	0/231	R
					R29330C	0/231	R
					R40270A	0/45	R
BHAST[1]	A2	JESD22-A110	130°C, 85%RH, Biased, 96 Hours	MAX9296A	R29330A	0/77	RH
					R29330B	0/77	RH
					R29330C	0/77	RH
UHAST[1]	A3	JESD22-A118	130°C, 85%RH, Unbiased, 96 Hours	MAX9296A	R29330A	0/77	R
					R29330B	0/77	R
					R29330C	0/77	R
Temperature Cycle[1]	A4	JESD22-A104	-65°C/+150°C, 500 Cycles	MAX9296A	R29330A	0/77	RH
					R29330B	0/77	RH
					R29330C	0/77	RH
Power Temp Cycle (PTC)[1]	A5	JESD22-A105	-40°C/+125°C, 1000 Cycles	MAX9296A	R40270A	0/45	RH
WBP Post-TC	C2	MIL-STD883 Method 2011	30 bonds min.	MAX9296A	R29330A	0/40	N/A
					R29330B	0/40	N/A
					R29330C	0/40	N/A
High Temperature Storage Life (HTSL)	A6	JESD22-A103	150°C, 1000 Hours	MAX9296A	R29330A	0/45	RH
Solderability (SOL)	C3	JESD22-B102 or J-STD-002D	N/A	MAX9296A	R29330A	0/15	N/A
High Temperature Operating Life (HTOL)	B1	JESD22-A108	Tjmax<150°C, Biased, 1000 Hours, TA 125C	MAX9296A	R29330A	0/77	RHC
					R29330B	0/77	RHC
					R29330C	0/77	RHC

[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 Results

ESD Model	Generic/Root Part #	Package	ESD Test Spec	RC Network	Highest Pass Level	Class	eTest
FICDM	MAX2172	40-TQFN	JS-002	1Ω, Cpkg	±500V (all pins) ±750V (corner pins)	C2a	RH RH
HBM	MAX2172	40-TQFN	JS-001	1.5kΩ, 100pF	±2500V	2	RH

Table 6: Latch-Up Test Results

LU Test Spec	Generic/Root Part #	Passing Current	Passing Over-Voltage	Temperature (Ta)	Class	eTest
JESD78	MAX2172	±100mA	+5.25V	85C	II	RH

Approvals

Reliability Engineer: Emerlaine Eunice Dionisio