Product/Process Change Notice - PCN 23_0004 Rev. A

Analog Devices, Inc. One Analog Way, Wilmington, MA 01887, USA

This notice is to inform you of a change that will be made to certain ADI products (see Appendix A) that you may have purchased in the last 2 years. **Any inquiries or requests with this PCN (additional data or samples) must be sent to ADI within 30 days of publication date.** ADI contact information is listed below.

Note: Revised fields are indicated by a red field name. See Appendix B for revision history.

PCN Title:	Assembly Site Transfer of Select PBGA Products to ASE Kaohsiung (AEG)
Publication Date:	23-Aug-2023
Effectivity Date:	23-Aug-2023 *(the earliest date that a customer could expect to receive changed material)*
Revision Description:	Qualification reports attached.

Description Of Change:

1) Assembly site for selected (23x23) and (27x27) PBGA parts are moving from ASE Chungli Taiwan (AET) to ASE Kaohsiung Taiwan (AEG).
2) Change in Die attach material from Ablestik 2100A to Ablestik 2100AC.

Existing qualified Bill of Material (BOM) in AEG will be used.

Reason For Change:

ASE Chungli Taiwan (AET) issued a discontinuance notice to ADI to close their 23x23mm and 27x27mm PBGA products assembly by April 2023.

ADI's assembly subcontractors manufacture our products using Analog Devices specified manufacturing flows, materials, process controls and monitors. This assures that our customers receive the same level of quality and reliability on products they receive from different manufacturing locations.

Impact of the change (positive or negative) on fit, form, function & reliability:

No impact on form, fit and function or reliability.

Product Identification *(this section will describe how to identify the changed material)*

Parts assembled at AEG will be identified by Assembly Lot number and Date Code.

Summary of Supporting Information:

Qualification will be performed per Industry Standard Test Methods. See attached Qualification Plan.

Supporting Documents

Attachment 1: Type: Detailed Change Description

ADI_PCN_23_0004_Rev_A_Material Set AET to AEG PBGA Transfer.pdf...

Attachment 2: Type: Qualification Results Summary

ADI_PCN_23_0004_Rev_A_Qualification Results Summary for 23x23 PBGA at ...

Attachment 3: Type: Qualification Results Summary

ADI_PCN_23_0004_Rev_A_Qualification Results Summary for 27x27 PBGA at ...

Note: If applicable, the device material declaration will be updated due to material change.

ADI Contact Information:

For questions on this PCN, please send an email to the regional contacts below or contact your local ADI sales representatives.

Americas:	Europe:	Japan:	Rest of Asia:
PCN_Americas@analog.com	PCN_Europe@analog.com	PCN_Japan@analog.com	PCN_ROA@analog.com

Appendix A - Affected ADI Models:

Existing Parts - Product Family / Model Number (8)				
ADSP-21060L / ADSP-21060LABZ-160	ADSP-21061L / ADSP-21061LKBZ-160	ADSP-21160M / ADSP-21160MKBZ-80	ADSP-21160N / ADSP-21160NCBZ-100	ADSP-BF561 / ADSP-BF561SBBZ500
ADSP-BF561 / ADSP-BF561SKBZ600	ADSP-TS101S / ADSP-TS101SAB1Z000	ADSP-TS101S / ADSP-TS101SAB1Z100		

Appendix B - Revision History:			
Rev	**Publish Date**	**Effectivity Date**	**Rev Description**
Rev. -	08-Mar-2023	10-Jun-2023	Initial Release
Rev. A	23-Aug-2023	23-Aug-2023	Qualification reports attached.

ANALOG DEVICES

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Assembly Site Transfer of Select PBGA Products to ASE Kaohsiung (AEG)

BOM Change Summary

- ADSP-21060L, ADSP-21061L and ADSP-21160M

Assembly Site	ASE Chungli Taiwan – AET (From)	ASE Kaohsiung Taiwan – AEG (To)
Wire	Au / 1.2 mil	Au / 1.2 mil
Die Attach	AB-2100A Conductive	AB-2100AC Conductive
Mold Compound	Hitachi CEL-9750	Hitachi CEL-9750
Ball Size	0.75	0.75
Ball Composition	96.5Sn_3.0Ag_0.5Cu	96.5Sn_3.0Ag_0.5Cu

BOM Change Summary

- ADSP-21160N

Assembly Site	ASE Chungli Taiwan – AET (From)	ASE Kaohsiung Taiwan – AEG (To)
Wire	Au / 1.0 mil	Au / 1.0 mil
Die Attach	AB-2100A Conductive	AB-2100A Conductive
Mold Compound	Hitachi CEL-9750	Hitachi CEL-9750
Ball Size	0.75	0.75
Ball Composition	96.5Sn_3.0Ag_0.5Cu	96.5Sn_3.0Ag_0.5Cu

BOM Change Summary

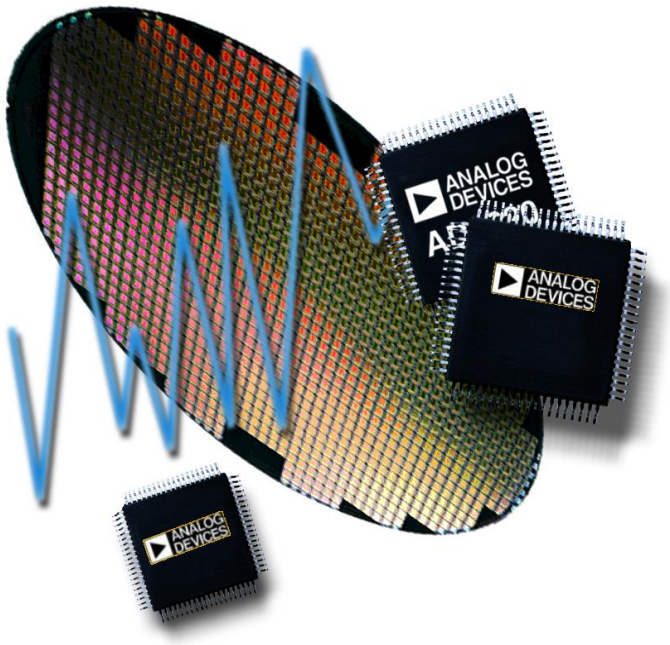
- ADSP-BF561

Assembly Site	ASE Chungli Taiwan – AET (From)	ASE Kaohsiung Taiwan – AEG (To)
Wire	Au / 1.0 mil	Au / 1.0 mil
Die Attach	AB-2100A Conductive	AB-2100AC Conductive
Mold Compound	Hitachi CEL-9750	Hitachi CEL-9750
Ball Size	0.6	0.6
Ball Composition	96.5Sn_3.0Ag_0.5Cu	96.5Sn_3.0Ag_0.5Cu

BOM Change Summary

- ADSP-TS101S

Assembly Site	ASE Chungli Taiwan – AET (From)	ASE Kaohsiung Taiwan – AEG (To)
Wire	Au / 1.2 mil	Au / 1.2 mil
Die Attach	AB-2100A Conductive	AB-2100AC Conductive
Mold Compound	Hitachi CEL-9750	Hitachi CEL-9750
Ball Size	0.6	0.6
Ball Composition	96.5Sn_3.0Ag_0.5Cu	96.5Sn_3.0Ag_0.5Cu



Reliability Report

Report Title: 23x23mm PBGA at AEG Qualification

Report Number: 20196

Revision: A

Date: 14 June 2023

Summary

This report documents the successful completion of the reliability qualification requirements for the release of the ADSP-21061L product in a 225-BGA package at ASE-AEG. The ADSP-21061L is a 32-bit processor optimized for high performance DSP applications. Table 1 and 3 provides the ADSP-21061L product characteristics.

Die/Fab Product Characteristics

Table 1: Die/Fab Product Characteristics- 0.5um CMOS

Product Characteristics	Product(s) to be qualified
Generic/Root Part #	ADSP-21061L
Die Id	TM4092 C-T6
Die Size (mm)	10.33 x 10.54
Wafer Fabrication Site	TSMC Fab-3
Wafer Fabrication Process	0.5um CMOS
Die Substrate	Si
Metallization / # Layers	AlCu(0.5%)/2
Polyimide	Yes
Passivation	undoped-oxide/SiN

Package/Assembly Product Characteristics

Table 3: Package/Assembly Product Characteristics - 225-BGA at ASE (AEG)

Product Characteristics	Product(s) to be qualified
Generic/Root Part #	ADSP-21061L
Package	225-BGA
Body Size (mm)	23.00 x 23.00 x 1.80
Assembly Location	ASE (AEG)
MSL/Peak Reflow Temperature(°C)	3 / 260°C
Mold Compound	Hitachi CEL9750ZHF10AK
Die Attach/Underfill/TIM	Ablestik 2100AC conductive
Terminal Finish Composition	96.5Sn_3.0Ag_0.5Cu
Wire Bond Material/Diameter (mils)	4N Gold / 1.20

Package/Assembly Test Results

Table 4: Package/Assembly Test Results - BGA at ASE (AEG)

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
High Temperature Storage Life (HTSL)[1]	JESD22-A103	150°C, 1,000 Hours	ADSP-21061L	Q20196.1.HS1	0/32
Solder Heat Resistance (SHR)[1]	J-STD-020	MSL-3	ADSP-21061L	Q20196.1.SH1	0/11
				Q20196.2.SH2	0/11
				Q20196.3.SH3	0/11
Temperature Cycling (TC)[1,2]	JESD22-A104	-55°C/+125°C, 1,000 Cycles	ADSP-21061L	Q20196.1.TC1	0/32
				Q20196.2.TC2	0/32
				Q20196.3.TC3	0/32
Unbiased HAST (UHST)[1,2]	JESD22-A118	130C 85%RH 33.3 psia, 96 Hours	ADSP-21061L	Q20196.1.UH1	0/32
				Q20196.2.UH2	0/32
				Q20196.3.UH3	0/32

[1] Electrical test was performed at Cold temperature.

[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.

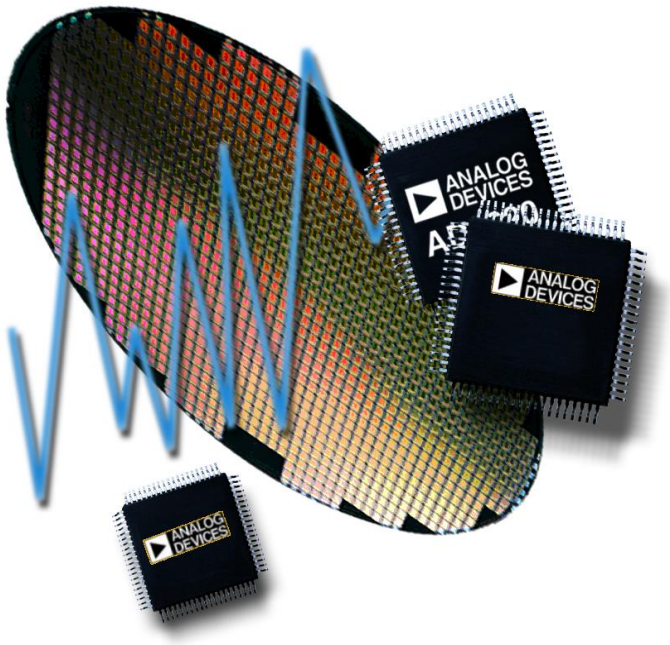
ESD and Latch-Up Test Results

Table 5: ESD Test Result

ESD Model	Generic/Root Part #	Package	ESD Test Spec	RC Network	Highest Pass Level	Class
FICDM	ADSP-21061L	225-BGA	JS-002	1Ω, Cpkg	±750V	C2b

Approvals

Reliability Engineer: Lucille Jordan



Reliability Report

Report Title: 27x27mm PBGA at AEG Qualification

Report Number: 20197

Revision: A

Date: 9 August 2023

Summary

This report documents the successful completion of the reliability qualification requirements for the release of the ADSP-TS101S product in a 625-BGA package. The ADSP-TS101S TigerSHARC® processor is an ultrahigh performance, Static Superscalar™ † processor optimized for large signal processing tasks and communications infrastructure. The DSP combines very wide memory widths with dual computation blocks—supporting 32- and 40-bit floating-point and 8-, 16-, 32-, and 64-bit fixed-point processing—to set a new standard of performance for digital signal processors.

Die/Fab Product Characteristics

Table 1: Die/Fab Product Characteristics

Product Characteristics	Product(s) to be qualified
Generic/Root Part #	ADSP-TS101S
Die Id	TMH742 D
Die Size (mm)	10.36 x 10.52
Wafer Fabrication Site	E_TSMC1212
Wafer Fabrication Process	0.13um CMOS
Die Substrate	Si
Metallization / # Layers	AlCu(0.5%)/8
Polyimide	Yes
Passivation	undoped-oxide/SiN

Package/Assembly Product Characteristics

Table 2: Package/Assembly Product Characteristics

Product Characteristics	Product(s) to be qualified
Generic/Root Part #	ADSP-TS101S
Package	625-BGA
Body Size (mm)	27.00 x 27.00 x 1.73
Assembly Location	ASE (AEG)
MSL/Peak Reflow Temperature(°C)	3 / 260°C
Mold Compound	Hitachi CEL9750ZHF10AK
Die Attach	Ablestik 2100AC conductive
Terminal Finish Composition	96.5Sn_3.0Ag_0.5Cu
Wire Bond Material/Diameter (mils)	4N Gold / 1.20

Package/Assembly Test Results

Table 3: Package/Assembly Test Results

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
High Temperature Storage Life (HTSL)[1]	JESD22-A103	150°C, 1,000 Hours	ADSP-TS101S	Q20197.1.HS1	0/32
Highly Accelerated Temperature and Humidity Stress Test (HAST)[1,2]	JESD22-A110	110C 85%RH 17.7 psia, Biased, P264	ADSP-TS101S	Q20197.1.HA1	0/32
				Q20197.2.HA2	0/32
				Q20197.3.HA3	0/32
Solder Heat Resistance (SHR)[1]	J-STD-020	MSL-3	ADSP-TS101S	Q20197.1.SH1	0/11
				Q20197.2.SH2	0/11
				Q20197.3.SH3	0/11
Temperature Cycling (TC)[1,2]	JESD22-A104	-55°C/+125°C, 1,000 Cycles	ADSP-TS101S	Q20197.1.TC1	0/32
				Q20197.2.TC2	0/32
				Q20197.3.TC3	0/32
Unbiased HAST (UHST)[1,2]	JESD22-A118	130C 85%RH 33.3 psia, 96 Hours	ADSP-TS101S	Q20197.1.UH1	0/32
				Q20197.2.UH2	0/32
				Q20197.3.UH3	0/32

[1] Electrical test was performed at Cold temperature.

[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 4: ESD Test Result

ESD Model	Generic/Root Part #	Package	ESD Test Spec	RC Network	Highest Pass Level	Class
FICDM	ADSP-TS101S	625-BGA	JS-002	1Ω, Cpkg	±250V[1]	C1

[1]Corner balls passed 2000V ESD FICDM (highest level tested).

Latch-up testing was not performed.

Approvals

Reliability Engineer: Lucille Jordan