Product/Process Change Notice - PCN 23_0063 Rev. -

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.

PCN Title:	Notification of Alternate Wafer Fab Location at ADI Camas for LTC6820
Publication Date:	17-Jul-2023
Effectivity Date:	19-Oct-2023 *(the earliest date that a customer could expect to receive changed material)*
Revision Description:	Initial Release.

Description Of Change:

Qualification of LTC6820 at ADI Camas Fab Facility (ADCS) as an alternate fab location.

Reason For Change:

Qualification of an additional wafer fabrication facility ensures continuity of supply to our customers.

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

This change will have no impact on the product, the alternate site will provide compatible performance in relation to form, fit and function.

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

Lot number traceability system will be used to identify where and when a device was fabricated.

Summary of Supporting Information:

Qualification has been performed per Industry Standard Test Methods. See attached Qualification Results.

Supporting Documents

Attachment 1: Type: Qualification Results Summary

ADI_PCN_23_0063_Rev_-_LTC6820 at Camas Qualification Report.pdf...

Attachment 2: Type: Delta Qualification Matrix

ADI_PCN_23_0063_Rev_-_LTC6820_Camas Fab Xfer_Delta Qualification_Matri...

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

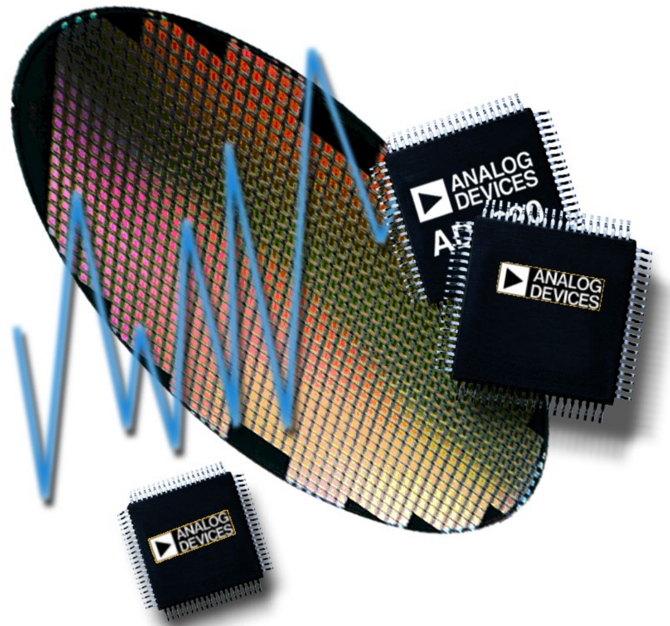
Appendix A - Affected ADI Models:

Added Parts On This Revision - Product Family / Model Number (12)

LTC6820 / LTC6820HMS#3ZZPBF	LTC6820 / LTC6820HMS#3ZZTRPBF	LTC6820 / LTC6820HMS#PBF	LTC6820 / LTC6820HMS#TRPBF	LTC6820 / LTC6820HUD#PBF
LTC6820 / LTC6820HUD#TRPBF	LTC6820 / LTC6820IMS#3ZZPBF	LTC6820 / LTC6820IMS#3ZZTRPBF	LTC6820 / LTC6820IMS#PBF	LTC6820 / LTC6820IMS#TRPBF
LTC6820 / LTC6820IUD#PBF	LTC6820 / LTC6820IUD#TRPBF			

Appendix B - Revision History:

Rev	Publish Date	Effectivity Date	Rev Description
Rev. -	17-Jul-2023	19-Oct-2023	Initial Release.



Reliability Report

Report Title: LTC6820 at Camas, UTAC Automotive Grade 1 Qualification

Report Number: 20202

Revision: A

Date: 20 April 2023

Summary

This report documents the successful completion of the automotive Grade 1 reliability qualification requirements for the release of the LTC6820 product in a 16-MINI_SO package. The LTC6820 is a isoSPI Isolated Communications Interface.

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 and 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 and 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 and 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	

Die/Fab Product Characteristics

Table 1: Die/Fab Product Characteristics- BiCMOS

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data					
Generic/Root Part #	LTC6820	LTC3875	LTC4079	LTC6115	LTC7000	LTC3851A	LTC3639
Die Id	6820	3875B	4079	6115	7000	3851A	3639B
Die Size (mm)	1.45 x 1.22	2.24 x 2.64	1.93 x 1.40	0.79 x 1.27	1.78 x 1.58	1.45 x 1.12	2.69 x 1.65
Wafer Fabrication Site	ADI Camas	ADI Camas	ADI Camas	ADI Camas	ADI Camas	ADI Camas	ADI Camas
Wafer Fabrication Process	BiCMOS	BiCMOS	BiCMOS	BiCMOS	BiCMOS	BiCMOS	BiCMOS
Die Substrate	Si	Si	Si	Si	Si	Si	Si
Metallization / # Layers	AlCu /2	AlCu /3	AlSiCu /2	AlCu /3	AlCu /3	AlSiCu /2	AlCu /3
Polyimide	No	No	No	No	No	No	No
Passivation	oxide/SiN	oxide/SiN	oxide/SiN	oxide/SiN	oxide/SiN	oxide/SiN	oxide/SiN

Die/Fab Test Results

Table 2: Die/Fab Test Results - BiCMOS at ADI-Camas, WA

Test Name	AEC #	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS	eTest Temp
Early Life Failure Rate (ELFR)	B2	AEC-Q100-008	Ta=150C, 48 Hours	LTC3639	Z52442.ELFR	0/800	RH
					Z52464.ELFR	0/800	RH
					Z52502.ELFR	0/800	RH
				LTC7000	Z45229.1C_ELF	0/800	RH
					Z45296.1C_ELF	0/800	RH
					Z45352.1C_ELF	0/800	RH
				LTC6115	899282.1	0/800	RH
					935916.1	0/800	RH
					956561.1	0/800	RH
High Temperature Operating Life (HTOL)	B1	JESD22-A108	Ta=125°C, Biased, 1,000 Hours	LTC3875	Q16447.1HTOL	0/77	RHC
				LTC4079	Z52302.HTOL	0/77	RHC
			Tj=150C, Biased, 1,000 Hours	LTC3871	Z52576.1a.HTOL	0/77	RHC
					Z52577.1a.HTOL	0/77	RHC
					Z52675.1a.HTOL	0/77	RHC
			Ta=150C, Biased, 1,000 Hours	LTC3639	Z52442.HTOL	0/77	RHC
					Z52464.HTOL	0/77	RHC
					Z52502.HTOL	0/77	RHC
			Ta=150C, Biased, 2,000 Hours	LTC7000	Q16995.2HTOL	0/77	RHC
High Temperature Storage Life (HTSL)	A6	JESD22-A103	150°C, 1,000 Hours	LTC2949	EO9423F.HTS	0/45	RH
			150°C, 2,000 Hours	LTC3639	Z52464.HTS	0/45	RH
				LTC7810	Q17143.1HTS	0/45	RH
Highly Accelerated Temperature and Humidity Stress Test (HAST)	A2	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	LTC3639	Z52442.JHAST	0/77	RH
					Z52464.JHAST	0/77	RH
					Z52502.JHAST	0/77	RH
				LTC3871	Z52675.JHAST	0/77	RH
				LTC4079	Z52275.JHAST	0/77	RH
					Z52302.JHAST	0/77	RH
Highly Accelerated Temperature and Humidity Stress Test (HAST)[1]	A2	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	LTC3851A	Q19568.1HAST	0/77	RH
Highly Accelerated Temperature and Humidity Stress Test (HAST)[2]	A2	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	LTC2949	EO9389K.BHAST	0/77	RH
					EO9423K.BHAST	0/77	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.

[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.

Package/Assembly Product Characteristics

Table 3: Package/Assembly Product Characteristics - 16-MINI_SO at UTAC

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data		
Generic/Root Part #	LTC6820	LTC7804	LTC2311	LT3990-5
Package	16-MINI_SO	16-MINI_SO_EP	16-MINI_SO_EP	16-MINI_SO_EP
Body Size (mm)	4.04 x 3.00 x 0.86	3.00 x 4.04 x 0.86	3.00 x 3.00 x 0.86	4.00 x 3.00 x 0.86
Assembly Location	UTAC	UTAC	UTAC	UTAC
MSL/Peak Reflow Temperature(°C)	1 / 260°C	1 / 260°C	1 / 260°C	1 / 260°C
Mold Compound	Sumitomo E670C	Sumitomo E670C	Sumitomo E670C	Sumitomo E670C
Die Attach	Ablestik 8290	Ablestik 8290	Ablestik 8290	Ablestik 8290
Leadframe Material	Copper	Copper	Copper	Copper
Lead Finish	100Sn	100Sn	100Sn	100Sn
Wire Bond Material/Diameter (mils)	Gold / 1.00	Gold / 1.00	Gold / 1.00	Gold / 1.00

Package/Assembly Test Results

Table 4: Package/Assembly Test Results - MINI_SO at UTAC

Test Name	AEC #	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS	eTest Temp
High Temperature Storage Life (HTSL)	A6	JESD22-A103	150°C, 2,000 Hours	LTC7804	Q16620.1HTS	0/45	RH
			150°C, 1,000 Hours	LTC2311	Q18459.1HTS	0/45	RH
					Z44356.1	0/45	RH
Highly Accelerated Temperature and Humidity Stress Test (HAST)[1]	A2	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	LTC7804	Q16620.1BHAST	0/77	RH
					Q16620.2BHAST	0/77	RH
				LTC2311	Q18459.1BHAST	0/77	RH
					Z44182.1	0/77	RH
					Z44356.1	0/77	RH
					Z44234.1	0/77	RH
				LT3990-5	Q19385.1.HA1	0/77	RH
					Q19385.3.HA2	0/77	RH
					Q19385.3.HA3	0/77	RH
Temperature Cycling (TC)[1]	A4	JESD22-A104	-65°C/+150°C, 2,000 Cycles	LTC7804	Q16620.1TC	0/77	RH
					Q16620.2TC	0/77	RH
					Q16620.3TC	0/77	RH
			-65°C/+150°C, 500 Cycles	LTC2311	Q18459.1TC	0/77	RH
					Z44182.1	0/77	RH
					Z44356.1	0/77	RH
					Z44234.1	0/77	RH
			-55C/+150C, 2,000 Cycles	LT3990-5	Q19385.1.TC1	0/77	H
					Q19385.2.TC2	0/77	H
					Q19385.3.TC3	0/77	H
Unbiased HAST (UHST)[1]	A3	JESD22-A118	130C 85%RH 33.3 psia, 96 Hours	LTC7804	Q16620.1UHAST	0/77	R
					Q16620.2UHAST	0/77	R
					Q16620.3UHAST	0/77	R
				LT3990-5	Q19385.1.UH1	0/77	R
					Q19385.2.UH2	0/77	R
Autoclave (AC)[1]	A3	JESD22-A102	121C 100%RH 33.3 psia, 168 Hours	LTC2311	Q18459.1PCT	0/77	R
					Z44182.1	0/77	R
					Z44356.1	0/77	R
					Z44234.1	0/77	R
Wire Bond Pull	C2	MIL-STD-883 M2011	Post TCT, Single Duration	LTC7804	Q16620.1WBP	0/5	NA
				LTC2311	Q18459.1WBP	0/5	NA
					Z44182.1	0/5	NA
Solder Heat Resistance (SHR)	A1	J-STD-020	MSL-1	LTC6820	Q20202.1SHR	0/30	R

[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	eTest Temp
FICDM	LTC6820	16-MINI_SO	JS-002	1Ω, Cpkg	±1250V	C3	RH
HBM	LTC6820	16-MINI_SO	ESDA/JEDEC JS-001	1.5kΩ, 100pF	±4000V	3A	RH

Table 6: Latch Up Test Result

LU Test Spec	Generic/Root Part #	Passing Current	Passing Over-Voltage	Temperature (T_A)	Class	eTest Temp
JESD78	LTC6820	+100mA, -100mA	+7V	125°C	II	RH

Approvals

Reliability Engineer: Katherine Cayago