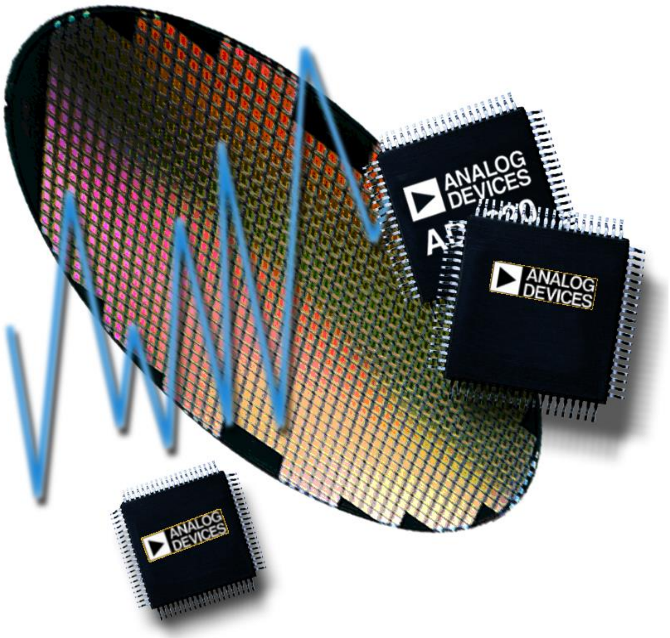

Reliability Report

Report Title: LT3752 Automotive Grade 0 Copper Wire Conversion at UTAC Qualification

Report Number: 22705

Revision: A

Date: 03 February 2026

Summary

This report documents the successful completion of the reliability qualification requirements for the automotive release of the LT3752 product in a 38-TSSOP_4.4_EP package using copper (Cu) wire, Sumitomo G605L as Mold Compound, and Atrox 558-2C31 electrically conductive and thermally high conductive as Die Attach at UTAC Thailand. The LT®3752/LT3752-1 are current mode PWM controllers optimized for an active clamp forward converter topology.

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 C1 is shown in Appendix. •Test C2 is 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
	Electrostatic Discharge Human Body Model	HBM	E2	
	Electrostatic Discharge Charged Device Model	CDM	E3	
	Latch-Up	LU	E4	
	Electrical Distributions	ED	E5	
	Fault Grading	FG	E6	
	Characterization	CHAR	E7	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
	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 at ADI-Camas, WA

Product Characteristics	Product(s) to be qualified	
Generic/Root Part #	LT3752	LTC7000
Die Id	6L3752-2XV-F 06	6L7000BXV-F 06
Die Size (mm)	1.98 x 2.57	1.78 x 1.57
Wafer Fabrication Site	ADI-Camas	ADI-Camas
Wafer Fabrication Process	BiCMOS	BiCMOS
Die Substrate	Si	Si
Metallization / # Layers	AlCu0.5%/3	AlCu0.5%/3
Polyimide	No	No
Passivation	undoped-oxide/SiN	doped-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
High Temperature Operating Life (HTOL)	B1	JESD22-A108	Ta=150°C, Tj=168°C, Biased, 1,000 Hours	LTC7000	Z45229.1	0/77	RHC
					Z45296.1	0/77	RHC
					Z45352.1	0/77	RHC
Early Life Failure Rate (ELFR)	B2	AEC-Q100-008	Ta=150°C, Tj=168°C, 48 Hours	LTC7000	Z45229.1	0/800	RH
					Z45296.1	0/800	RH
					Z45352.1	0/800	RH

Package/Assembly Product Characteristics

Table 3: Package/Assembly Product Characteristics - 38-TSSOP_4.4_EP at UTAC (UT3)

Product Characteristics	Product(s) to be qualified
Generic/Root Part #	LT3752
Package	38-TSSOP_4.4_EP
Body Size (mm)	6.40 x 9.80 x 1.20
Assembly Location	UTAC (UT3)
MSL/Peak Reflow Temperature(°C)	1 / 260°C
Mold Compound	Sumitomo G605L
Die Attach/Underfill/TIM	Atrox 558-2C31 electrically conductive and thermally high conductive
Leadframe Material	Copper
Lead Finish	100Sn
Wire Bond Material/Diameter (mils)	PdCuAu 4N / 1.00

Package/Assembly Test Results

Table 4: Package/Assembly Test Results - 38-TSSOP_4.4_EP at UTAC (UT3)

Test Name	AEC #	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS	eTest Temp
High Temperature Storage Life (HTSL)	A6	JESD22-A103	150°C, 4,000 Hours	LT3752	Q22705.1.HT1	0/45	RH
					Q22705.2.HT2	0/45	RH
					Q22705.3.HT3	0/45	RH
Solder Heat Resistance (SHR)	A1	J-STD-020	MSL-1	LT3752	Q22705.1.SH1	0/11	R
					Q22705.2.SH2	0/11	R
					Q22705.3.SH3	0/11	R
Temperature Cycling (TC)[1]	A4	JESD22-A104	-55°C/+150°C, 3000 Cycles	LT3752	Q22705.1.TC1	0/77	RH
					Q22705.2.TC2	0/77	RH
					Q22705.3.TC3	0/77	RH
Unbiased HAST (UHST)[1]	A3	JESD22-A118	130C 85%RH 33.3 psia, 96 Hours	LT3752	Q22705.1.UH1	0/77	R
					Q22705.2.UH2	0/77	R
					Q22705.3.UH3	0/77	R
Highly Accelerated Temperature and Humidity Stress Test (HAST)[1]	A2	JESD22-A110	130°C 85%RH 33.3 psia, Biased, 192 Hours	LT3752	Q22705.1.HA1	0/77	RH
					Q22705.2.HA2	0/77	RH
					Q22705.3.HA3	0/77	RH
Wire Bond Pull – Post TC	C2	AEC-Q003	3gF	LT3752	Q22705.1.TC1W_P1500_CuW	0/5	NA

[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
HBM	LT3752	38-TSSOP_4.4_EP	JS-001	1.5kΩ, 100pF	±3000V	2	RH
FICDM	LT3752	38-TSSOP_4.4_EP	JS-002	1Ω, Cpkg	±750V	C2b	RH

Table 6: Latch Up Test Results

LU Test Spec	Generic/Root Part #	Passing Current	Temperature (T_A)	Class	eTest
JESD78	LT3752	+100mA, -100mA	150°C	II	RH

Approvals

Reliability Engineer: Cyrus De Leon

Appendix

AEC-Q006 – Qualification Requirements for Products using Cu Wire Interconnections

Step	**Stress Test** **Qualification Step**	**TC (-55°C to 150°C) JESD22-A104**	**THB (85°C/85% RH) JESD22A-101**	**PTC (-40°C to 125°C) JESD22-A104**	**HTSL (150°C) JESD22-A103**
1	Initial Sampling (T0) [*1]	Sample Sizes as required			
2	CSAM @ T0	Sample Sizes as required			
3	Preconditioning to MSLx	3x77	3x77	1x45	--
4	CSAM after PC	3x22	3x22	1x22	--
5	ATE Test [*1]	3x77	3x77	1x45	3x45
6	Stress 1x	3x77	3x77	1x45	3x45
7	ATE Test [*1]	3x77	3x77	1x45	3x45
8	CSAM post-1x Stress	3x22	3x22	--	--
9a	Ball + Stitch/Wedge Pull	3x3	3x3	--	--
9b	Ball Shear	3x3	3x3	--	--
10	Cross-Section	3x1	3x1	--	3x1
11	Stress 2x	3x70	3x70	1x45	3x44
12	ATE Test [*1]	3x70	3x70	1x45	3x44
13	CSAM post-2x Stress	3x22	3x22	--	--
14a	Ball + Stitch/Wedge Pull	3x2	3x2	--	--
14b	Ball Shear	3x2	3x2	--	--
15	Cross-Section	3x1	3x1	--	3x1

[1] This footnote should highlight the ATE temperature used.

AEC-Q006 - 38-TSSOP_4.4_EP at UTAC (UT3) Package/Assembly Test Results

Rel Lot Number		**Q22705.1.TC1**	**Q22705.1.HA1**	**Q22705.1.HT1**	**Q22705.2.TC2**	**Q22705.2.HA2**	**Q22705.2.HT2**	**Q22705.3.TC3**	**Q22705.3.HA3**	**Q22705.3.HT3**
AEC#	**Test**	**TC**	**HAST**	**HTS**	**TC**	**HAST**	**HTS**	**TC**	**HAST**	**HTS**
1	Initial Sampling (T0)[1]	0/77	0/77	0/45	0/77	0/77	0/77	0/77	0/77	0/45
2	CSAM @T0	0/22	0/22	-	0/22	0/22	-	0/22	0/22	-
3	Preconditioning to MSLx	0/77	0/77	-	0/77	0/77	-	0/77	0/77	-
4	CSAM after PC	0/22	0/22	-	0/22	0/22	-	0/22	0/22	-
5	ATE Test[1]	0/77	0/77	0/45	0/77	0/77	0/77	0/77	0/77	0/45
6	Stress 1x	0/77	0/77	0/45	0/77	0/77	0/77	0/77	0/77	0/45
7	ATE Test[1]	0/77	0/77	0/45	0/77	0/77	0/77	0/77	0/77	0/45
8	CSAM post-1x stress	0/22	0/22	-	0/22	0/22	-	0/22	0/22	-
9a	Ball + Stitch/Wedge Pull	0/5	0/3	-	0/3	0/3	-	0/3	0/3	-
9b	Ball Shear	0/5	0/3	-	0/3	0/3	-	0/3	0/3	-
10	Cross-section	0/1	0/1	-	0/1	0/1	-	0/1	0/1	-
11	Stress 2x	0/70	0/70	0/44	0/70	0/70	0/44	0/70	0/70	0/44
12	ATE Test	0/70	0/70	0/44	0/70	0/70	0/44	0/70	0/70	0/44
13	CSAM post-2x stress	0/22	0/22	-	0/22	0/22	-	0/22	0/22	-
14a	Ball + Stitch/Wedge Pull	0/2	0/2	-	0/2	0/2	-	0/2	0/2	-
14b	Ball shear	0/2	0/2	-	0/2	0/2	-	0/2	0/2	-
15	Cross-section	0/1	0/1	-	0/1	0/1	-	0/1	0/1	-