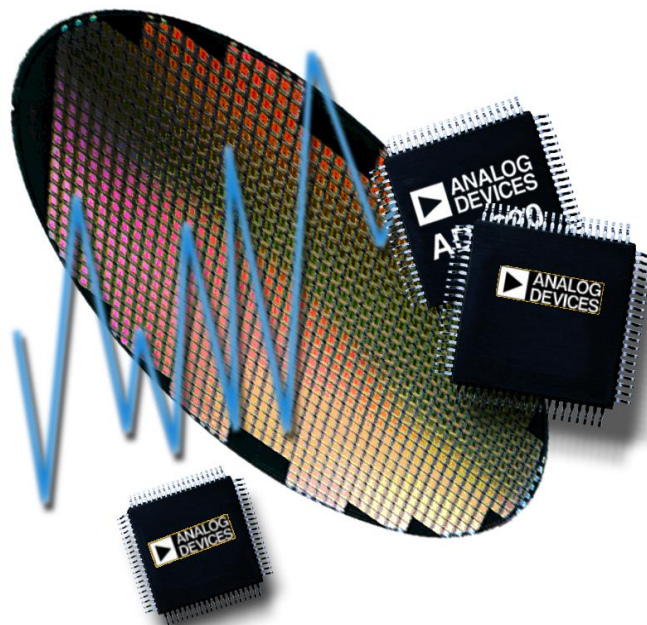




Reliability Report

Report Title:	LTM8083 Material Set Change Qualification
Report Number:	21966
Revision:	A
Date:	20 May 2024

Summary

This report documents the successful completion of the reliability qualification requirements for the release of the material set change of the LTM8083 product in a 49-CSP_BGA package. The LTM8083 is 36V, 1.5A Buck-Boost μ Module regulator. The only change made is the die thickness from 450um to 200um.

Die/Fab Product Characteristics

Table 1: Die/Fab Product Characteristics

Product Characteristics	Product(s) to be qualified
Generic/Root Part #	LTM8083
Die Id	3942-9
Die Size (mm)	2.29 x 2.78
Wafer Fabrication Site	Vanguard
Wafer Fabrication Process	0.35um DMOS
Die Substrate	Si
Metallization / # Layers	AlCu/ 3
Polyimide	No
Passivation	undoped-oxide/SiN

Die/Fab Test Results

Table 2: Die/Fab Test Results - 0.35um DMOS at Vanguard

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
Highly Accelerated Stress Test (HAST) ¹	JESD22-A110	+130°C/85%RH, Biased, 96 hours	LTM8083	EO9485K.RCMB	0/20
				Q14517.2	0/20
				Q14517.9	0/20
High Temperature Storage Life (HTSL)	JESD22-A103	+150°C, 1,000 hours	LTM8083	EO9485F.HTS	0/45
				Q14517.4	0/45
				Q14517.13	0/45
High Temperature Operating Life (HTOL)	JESD22-A108	Ta = 125C, Biased, 1000 hours	LTM8083	1021398.1	0/77
				1042084.1	0/77
				1042085.1	0/77
Power Cycling	JESD22-A122	Tj=50°C to 125°C, Biased, 50,000 Cycles.	LTM8083	1021398.1	0/8
				1042084.1	0/8
				1042085.1	0/8

¹ These samples were subjected to preconditioning (per J-STD-020 Level 3) prior to the start of the stress test. Level 3 preconditioning consists of the following: Bake: 48 hrs @ 125°C, Unbiased Soak: 192 hrs @ 30°C, 60%RH, Reflow: 3 passes through an oven with a peak temperature of 260°C.

Package/Assembly Product Characteristics

Table 3: Package/Assembly Product Characteristics - 49-CSP_BGA at ASE Korea

Product Characteristics	Product(s) to be qualified
Generic/Root Part #	LTM8083
Package	49-CSP_BGA
Body Size (mm)	6.25 x 6.25 x 2.22
Assembly Location	ASE Korea
MSL/Peak Reflow Temperature(°C)	3 / 260°C
Mold Compound	Sumitomo G311E
Substrate Material	BT Resin
Solder Ball Composition	96.5Sn3Ag0.5Cu
Bump Composition	Cu Pillar/SnAg bump

Package/Assembly Test Results

Table 4: Package/Assembly Test Results - CSP_BGA at ASE Korea

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
Solder Heat Resistance (SHR) ¹	J-STD-020	MSL-3	LTM8083	Q21966.1.SHR ²	0/246
Temperature Cycling (TC) ¹	JESD22-A104	-55°C/+125°C, 1,000 Cycles	LTM8083	Q21966.1.TC ²	0/77
				EO9485B1.TC	0/77
				Q14517.5	0/77
				Q14517.11	0/77
Highly Accelerated Stress Test (HAST) ¹	JESD22-A110	+130°C/85%RH, Biased, 96 hours	LTM8083	EO9485K.RCMB	0/20
				Q14517.2	0/20
				Q14517.9	0/20
Unbiased HAST (UHAST) ¹	JESD22-A118	+130°C/85%RH, 96 hours	LTM8083	EO9485K1.UHAST	0/77
				Q14517.7	0/77
				Q14517.10	0/77
High Temperature Storage Life (HTSL)	JESD22-A103	+150°C, 1,000 hours	LTM8083	EO9485F.HTS	0/50
				Q14517.4	0/50
				Q14517.13	0/50

¹ These samples were subjected to preconditioning (per J-STD-020 Level 3) prior to the start of the stress test. Level 3 preconditioning consists of the following: Bake: 48 hrs @ 125°C, Unbiased Soak: 192 hrs @ 30°C, 60%RH, Reflow: 3 passes through an oven with a peak temperature of 260°C.

² Stress test with 200µm die.

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	LTM8083	49-CSP_BGA	JS-002	1Ω, Cpkg	±2000V	C3
HBM	LTM8083	49-CSP_BGA	JS-001	1.5kΩ, 100pF	±4000V	2

Table 6: Latch Up Test Result

LU Test Spec	Generic/Root Part #	Passing Current	Passing Over-Voltage	Temperature (T _A)	Class
JESD78	LTM8083 ¹	+200mA, -200mA	+6/43V	25°C	I

¹ Stress test with 200μm die.

Approvals

Reliability Engineer: Lay Yong Ong