



# ***Reliability Report***

**Report Title:** LTM4703 Material Set Change Qualification

**Report Number:** 22426

**Revision:** A

**Date:** 07 March 2025

## Summary

This report documents the successful completion of the reliability qualification requirements for the release of the material set change of the LTM4703 product in a 49-CSP\_BGA package. The LTM4703 is a complete 16 Vin, 12A step-down Silent Switcher  $\mu$ Module regulator with low noise reference. The only change made is the die thickness from 200um to 150um.

## Die/Fab Product Characteristics

**Table 1: Die/Fab Product Characteristics- 0.35um BCDMOS**

Product Characteristics	Product(s) to be qualified
Generic/Root Part #	LTM4703
Die Id	8627-9
Die Size (mm)	3.59 x 1.77
Wafer Fabrication Site	Vanguard
Wafer Fabrication Process	0.35um BCDMOS
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 BCDMOS at Vanguard**

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
High Temperature Operating Life (HTOL)	JESD22-A108	Ta=125°C, Biased, 1,000 Hours	LTM4703	Q21526.1.HTOL	0/77
				Q21526.2.HTOL.2nd	0/77
				Q21526.3.HTOL.3rd	0/77
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	LTM4703	Q21526.2.HTS	0/50
				Q21526.3.HTS.2nd	0/50
				Q21526.4.HTS.3rd	0/50
Highly Accelerated Temperature and Humidity Stress Test (HAST) <sup>1</sup>	JESD22-A110	110C 85%RH 17.7 psia, Biased, 264 hours	LTM4703	Q21526.2.BHAST	0/30
				Q21526.3.BHAST.2nd	0/30
				Q21526.4.BHAST.3rd	0/30
Power Cycling	JESD22-A122	Tj=50°C to 125°C, Biased, 50,000 Cycles	LTM4703	Q21526.1.PC.1st	0/8
				Q21526.2.PC.2nd	0/8
				Q21526.3.PC.3rd	0/8

<sup>1</sup>These samples were subjected to preconditioning (per J-STD-020 Level 4) prior to the start of the stress test. Level 4 preconditioning consists of the following: Bake: 48 hrs @ 125°C, Unbiased Soak: 96 hrs @ 30°C, 60%RH, Reflow: 3 passes through an oven with a peak temperature of 250°C.

**Package/Assembly Product Characteristics**
**Table 3: Package/Assembly Product Characteristics - 49-CSP\_BGA at ASE Korea**

<b>Product Characteristics</b>	<b>Product(s) to be qualified</b>
Generic/Root Part #	LTM4703
Package	49-CSP_BGA
Body Size (mm)	6.25 x 6.25 x 5.07
Assembly Location	ASE Korea
MSL/Peak Reflow Temperature(°C)	4 / 250
Mold Compound	Sumitomo G311E
Substrate Material	BT Resin
Terminal Finish Composition	96.5Sn_3.0Ag_0.5Cu
Solder Ball Size (mm)	0.50

## 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
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	LTM4703	Q21526.2.HTS	0/50
				Q21526.3.HTS.2nd	0/50
				Q21526.4.HTS.3rd	0/50
Highly Accelerated Temperature and Humidity Stress Test (HAST) <sup>1</sup>	JESD22-A110	110C 85%RH 17.7 psia, Biased, 264 hours	LTM4703	Q21526.2.BHAST	0/30
				Q21526.3.BHAST.2nd	0/30
				Q21526.4.BHAST.3rd	0/30
Solder Heat Resistance (SHR)	J-STD-020	MSL-4	LTM4703	Q22426.1.MSL4 <sup>2</sup>	0/231
				Q21526.2.MSL4.2nd	0/77
				Q21526.3.MSL4.3rd	0/77
				Q21526.1.MSL4	0/77
Temperature Cycling (TC) <sup>1</sup>	JESD22-A104	-55°C/+125°C, 1,000 Cycles	LTM4703	Q22426.1.TC3 <sup>2</sup>	0/77
				Q21526.1.TCSoak3	0/77
				Q21526.2.TC.S3.2nd	0/77
				Q21526.3.TC3.3rd	0/77
Unbiased HAST (UHST) <sup>1</sup>	JESD22-A118	110C 85%RH 17.7 psia, 264 hours	LTM4703	Q21526.1.UHAST	0/77
				Q21526.2.UHAST.2nd	0/77
				Q21526.3.UHAST.3rd	0/77

<sup>1</sup> These samples were subjected to preconditioning (per J-STD-020 Level 4) prior to the start of the stress test. Level 4 preconditioning consists of the following: Bake: 48 hrs @ 125°C, Unbiased Soak: 96 hrs @ 30°C, 60%RH, Reflow: 3 passes through an oven with a peak temperature of 250°C.

<sup>2</sup> Stress test with 150um die

Note: J-STD-020 rework compatibility was verified passing by performing Bake: 48 hrs @ 125°C, Unbiased Soak: 8 hrs @ 30°C, 60%RH, Reflow: 1 pass through a reflow oven with a peak temperature of 260°C.

## 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	LTM4703	49-CSP_BGA	JS-002	1Ω, Cpkg	±1250V	C3
HBM	LTM4703	49-CSP_BGA	JS-001	1.5kΩ, 100pF	±4000V	3A

**Table 6: Latch Up Test Result**

LU Test Spec	Generic/Root Part #	Passing Current	Passing Over-Voltage	Temperature (T <sub>A</sub> )	Class
JESD78	LTM4703 <sup>1</sup>	+200mA, -200mA	+22/6V	25°C	II.A

<sup>1</sup> Stress test with 150um die

## Approvals

Reliability Engineer: Lay Yong Ong