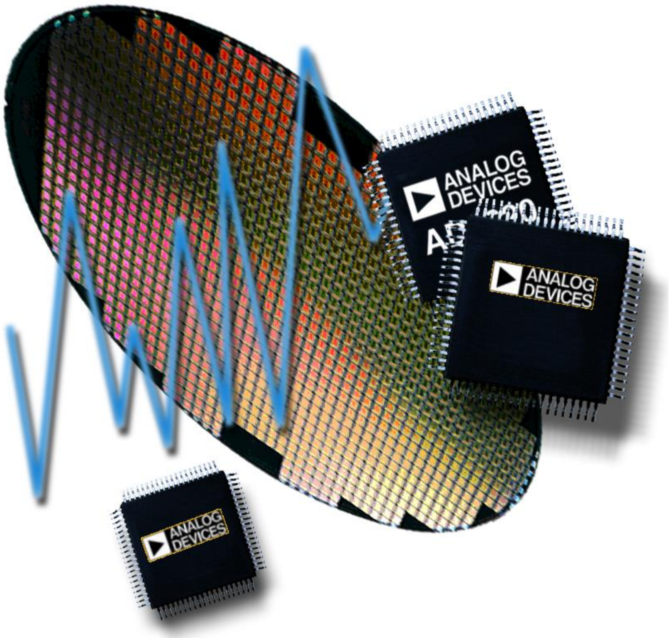

Reliability Report

Report Title: LTC3833 TSSOP Die Revision Qualification

Report Number: 20514

Revision: A

Date: 28 November 2025

Summary

This report documents the successful completion of the reliability qualification requirements for the Die Revision (routing change) Qualification release of the LTC3833 product in a 20-TSSOP_4.4_EP package. The LTC3833 is a synchronous step-down DC/DC switching regulator controller targeted for high power applications. It drives all N-channel power MOSFETs.

Die/Fab Product Characteristics

1: Die/Fab Product Characteristics- 0.6µm BiCMOS

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data		
Generic/Root Part #	LTC3833	LTC3850	LTC4359	LTC6804-1
Die Id	3833-9	8VL3850XV	L4359D	L6804BSXV
Die Size (mm)	1.51 x 1.51	1.58 x 1.52	1.65 x 1.04	3.81 x 4.72
Wafer Fabrication Site	Vanguard Fab1	Vanguard Fab1	Vanguard Fab1	Vanguard Fab1
Wafer Fabrication Process	0.6µm BiCMOS	0.6µm BiCMOS	0.6µm BiCMOS	0.6µm BiCMOS
Die Substrate	Si	Si	Si	Si
Metallization	AlCu	AlCu	AlCu	AlCu
Polyimide	No	No	No	No
Passivation	oxide/SiN	undoped-oxide/SiN	undoped-oxide/SiN	undoped-oxide/SiN

Die/Fab Test Results

Table 2: Die/Fab Test Results - 0.6µm BiCMOS at Vanguard

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
Early Life Failure Rate (ELFR)	AEC-Q100-008	125°C, 48 Hours	LTC3850	Z47785.ELF	0/800
				Z47818.ELF	0/800
				Z48161.ELF	0/800
			LTC6804-1	Q14858.1	0/800
				Q14858.2	0/800
				Q14858.3	0/800
	JESD22-A108 / JESD74		LTC4359	Q18141.1ELFX	0/800
				Q18141.5ELFX	0/800
High Temperature Operating Life (HTOL)	JESD22-A108	Ta=125°C, Biased, 1,000 Hours	LTC4359	Q18141.1HTOL	0/77
				Q18141.4HTOL	0/77
				Q18141.5HTOL	0/77
			LTC6804-1	Q14858.1HTOL	0/77
				Q14858.2HTOL	0/77
				Q14858.3HTOL	0/77
			LTC3850	Z47785.HTOL	0/77
				Z47818.HTOL	0/77
				Z48161.HTOL	0/77
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	LTC6804-1	Q18270.1HTS	0/45
			LTC4359	Q18141.1HTS	0/45
		175°C, 1,000 Hours	LTC3850	Z47785.HTS	0/45
Highly Accelerated Temperature and Humidity Stress Test (HAST)[1]	JESD22-A110	130°C 85%RH 33.3 psia, Biased, 96 Hours	LTC4359	Q16937.3BHAST	0/77
				Q16937.4BHAST	0/77
				Q16937.5BHAST	0/77
			LTC3850	Z47785.JHAST[3]	0/77
				Z47818.JHAST[3]	0/77
				Z48161.JHAST[3]	0/77
Highly Accelerated Temperature and Humidity Stress Test (HAST)[2]	JESD22-A110	130°C 85%RH 33.3 psia, Biased, 96 Hours	LTC6804-1	Q14858.1BHAST	0/77
				Q14858.2BHAST	0/77
				Q14858.3BHAST	0/77

[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.

[3] Lot extended up to 192 hours

Package/Assembly Product Characteristics

Table 3: Package/Assembly Product Characteristics - 20-TSSOP_4.4_EP

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data			
Generic/Root Part #	LTC3833	LT8316	LT3795	LTC3859A	LT8390
Package	20-TSSOP_4.4_EP	20-TSSOP_4.4_EP	28-TSSOP_4.4_EP	38-TSSOP_4.4_EP	28-TSSOP_4.4_EP
Body Size (mm)	4.30 x 6.40 x 1.20	6.50 x 4.40 x 1.10	9.80 × 4.50 × 1.10	5.00 × 7.00 × 0.75	9.80 x 6.40 x 1.20
Assembly Location	UTAC (UT3)	UTAC (UT3)	UTAC (UT3)	UTAC (UT3)	UTAC (UT3)
MSL/Peak Reflow Temperature(°C)	1 / 260°C	1 / 260°C	1 / 260°C	1 / 260°C	1 / 260°C
Mold Compound	Sumitomo G605L	Sumitomo G605L	Sumitomo G605L	Sumitomo G605L	Sumitomo G605L
Die Attach	Ablestik 8200C conductive	Ablestik 8200C conductive	Ablestik 8200C conductive	Ablestik 8200C conductive	Ablestik 8200C conductive
Leadframe Material	Copper	Copper	Copper	Copper	Copper
Lead Finish	100Sn	100Sn	100Sn	100Sn	100Sn
Wire Bond Material/Diameter (mils)	Gold / 1.00	Gold / 1.00	Gold / 1.00	Gold / 1.00	Gold / 1.00

Package/Assembly Test Results

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

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
Autoclave (AC)[1]	JESD22-A102	121C 100%RH 33.3 psia, 168 Hours	LT8390	Q16133.1PCT	0/77
				Q16133.2PCT	0/77
				Q16133.3PCT	0/77
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	LT8390	Q16133.1HTS[2]	0/45
			LT8316	Q16439.1HTS[2]	0/45
			LT3795	EO9570F.HTS[2]	0/45
Highly Accelerated Temperature and Humidity Stress Test (HAST)[1]	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	LTC3859A	Z51543.JHAST	0/77
				Z51544.JHAST	0/77
				Z51779.JHAST	0/77
			LT8316	Q19691.1HAST	0/77
				Q19691.2HAST	0/77
				Q16439.BHAST1[3]	0/77
			LT3795	EO9570K.BHAST[3]	0/77
				EO9571K.BHAST[3]	0/77
				EO9572K.BHAST[3]	0/77
Solder Heat Resistance (SHR)	J-STD-020	MSL-1	LTC3833	Q19016.1SHR	0/30
Temperature Cycling (TC)[1]	JESD22-A104	-65°C/+150°C, 500 Cycles	LT8316	Q16439.1TC[4]	0/77
				Q16439.5TC[4]	0/77
				Q16439.4TC[4]	0/77
			LT3795	EO9570B.TC[5]	0/77
				EO9571B.TC[5]	0/77
				EO9572B.TC[5]	0/77
			LT8390	Q18097.5.PC.BHAST[5]	0/77
				Q18097.15.PC.HAST[5]	0/77
				Q18097.12PC.BHAST[5]	0/77
Unbiased HAST (UHST)[1]	JESD22-A118	130C 85%RH 33.3 psia, 96 Hours	LTC3859A	Z51543.JUHAST	0/77
				Z51544.JUHAST	0/77
				Z51779.JUHAST	0/77
			LT8316	Q16439.1UHAST[3]	0/77

				Q16439.4UHAST[3]	0/77
				Q16439.5UHAST[3]	0/77

[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] Lot extended up to 2000 hours

[3] Lot extended up to 192 hours

[4] Lot extended up to 1000 cycles

[5] Lot extended up to 2000 cycles

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	LTC3833	20-TSSOP_4.4_EP	JS-002	1Ω, Cpkg	±1250V	C3
HBM	LTC3833	20-TSSOP_4.4_EP	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_A)	Class
JESD78	LTC3833	+200mA, -200mA	+41, +6.3, +6.3V	125°C	II

Approvals

Reliability Engineer: Ryell Keena Lagamayo