



Reliability Report

Report Title: ADM4857 at ADI - Limerick
Qualification Report

Report Number: 20100

Revision: A

Date: 11 January 2023

Summary

This report documents the successful completion of the reliability qualification requirements for the release of the ADM4857 product in an 8-SOIC_N package. The ADM4857 is a differential line transceiver suitable for high speed, full duplex data communication on multipoint bus transmission lines. It is designed for balanced data transmission and comply with EIA Standards RS-485 and RS-422.

Die/Fab Product Characteristics

Table 1: Die/Fab Product Characteristics- 0.6um CMOS

Product Characteristics	Product(s) to be qualified	Product(s) used for Substitution Data			
		ADUM1233	ADM483E	ADM2587E	ADM3483E
Generic/Root Part #	ADM4857	ADUM1233	ADM483E	ADM2587E	ADM3483E
Die Id	8YP80 C	8YG12 E	8YM79 F05	8YR05 E	8YR05 E
Die Size (mm)	1.41 x 1.55	0.87 x 0.86	1.57 x 1.58	1.81 x 2.83	1.81 x 2.83
Wafer Fabrication Site	ADI - Limerick	ADI - Limerick	ADI - Limerick	ADI - Limerick	ADI - Limerick
Wafer Fabrication Process	0.6um CMOS	0.6um CMOS	0.6um CMOS	0.6um CMOS	0.6um CMOS
Die Substrate	Si	Si	Si	Si	Si
Metallization / # Layers	AlCu/2	AlCu/2	AlCu/2	AlCu/2	AlCu/2
Polyimide	No	No	No	Yes	No
Passivation	undoped-oxide/SiN	undoped-oxide/SiN	undoped-oxide/SiN	undoped-oxide/OxyNitride	undoped-oxide/SiN

Die/Fab Test Results
Table 2: Die/Fab Test Results - 0.6um CMOS at ADI-Limerick

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
High Temperature Operating Life (HTOL)	JESD22-A108	125°C<Tj<135°C, Biased, 1,000 Hours	ADM3483E	Q19380.1.HO1	0/77
			ADM213E	Q10524.HO2	0/77
High Temperature Operating Life (HTOL) ¹			ADM487E	Q10436.HO1	0/77
				Q10436.HO2	0/77
			Q10436.HO3	0/77	
Early Life Failure Rate (ELFR)	MIL-STD-883, M1015	125°C, 48 Hours	ADM483E	Q11384.5	0/2010
			ADM487E	Q10524.EL1A	0/195
				Q10524.EL1C	0/195
				Q10524.EL2A	0/195
				Q10524.EL2B	0/195
				Q10524.EL2C	0/195
				Q10524.EL2D	0/77
				Q10524.EL3A	0/195
				Q10524.EL3B	0/195
				Q10524.EL3C	0/195
Q10524.EL3D	0/77				
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	ADM2587E	Q7572.300	0/77
			ADM213E	Q10524.HS2	0/45
High Temperature Storage Life (HTSL) ²			ADM487E	Q10436.HS1	0/45
Temperature Cycling (TC) ⁴	JESD22-A104	-65°C/+150°C, 500 Cycles	ADM487E	Q10436.TC1	0/77
				Q10436.TC2	0/77
				Q10436.TC3	0/77
			ADUM1233	Q11317.TC1	0/77
				Q11317.TC2	0/77
				Q11317.TC3	0/77
			ADM2483	Q14014.TC1	0/77
				Q13140.TC1	0/77
				Q13926.TC1	0/77

Highly Accelerated Temperature and Humidity Stress Test (HAST) ^{3,4}	JESD22-A110	130C 85%RH 33.3 psia, Biased, 96 Hours	ADUM1233	Q11317.HA1	0/77		
				Q11317.HA2	0/77		
				Q11317.HA3	0/77		
Highly Accelerated Temperature and Humidity Stress Test (HAST) ^{2,3}	JESD22-A110		130C 85%RH 33.3 psia, Biased, 96 Hours	ADM487E	Q10436.HA1	0/77	
					Q10436.HA2	0/77	
					Q10436.HA3	0/77	
Highly Accelerated Temperature and Humidity Stress Test (HAST) ³	JESD22-A110			130C 85%RH 33.3 psia, Biased, 96 Hours	ADM2587E	Q7572.200	0/77
						Q7572.201	0/77
						Q7572.202	0/77

¹ Pre- and post-stress electrical test was performed at hot, room and cold temperatures.

² Pre- and post-stress electrical test was performed at room and hot temperatures.

³ 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.

⁴ Electrical test was performed at Room/HV temperature.

ESD Test Results

The results of Human Body Model (HBM) ESD testing is summarized in Table 3. ADI measures ESD results using stringent test procedures based on the specifications listed. Any comparison with another supplier's results should ensure that the same ESD test procedures have been used. For further details, please see the EOS/ESD chapter of the ADI Reliability Handbook (available via the 'Quality and Reliability' link on [Analog Devices' web site](#)).

Table 3: ADM4857 ESD Test Results

ESD Model	Package	ESD Test Spec	RC Network	Highest Pass Level	First Fail Level	Class
HBM	124-CSP_BGA	ESDA/JEDEC JS-001-2011	1.5kΩ, 100pF	±4000V	NA	3A
FICDM	124-CSP_BGA	JS-002	1Ω, Cpkg	±1250V	NA	C3

Latch-Up Test Results

Three samples of the ADM4857 were latch-up tested at $T_A=25^{\circ}\text{C}$ per JEDEC Standard JESD78, Class I. All pins passed.

Passing Positive Current	Passing Negative Current	Passing Over-Voltage
+200mA	-200mA	7.9V

Approvals

Reliability Engineer: Danilo Juinio Jr.