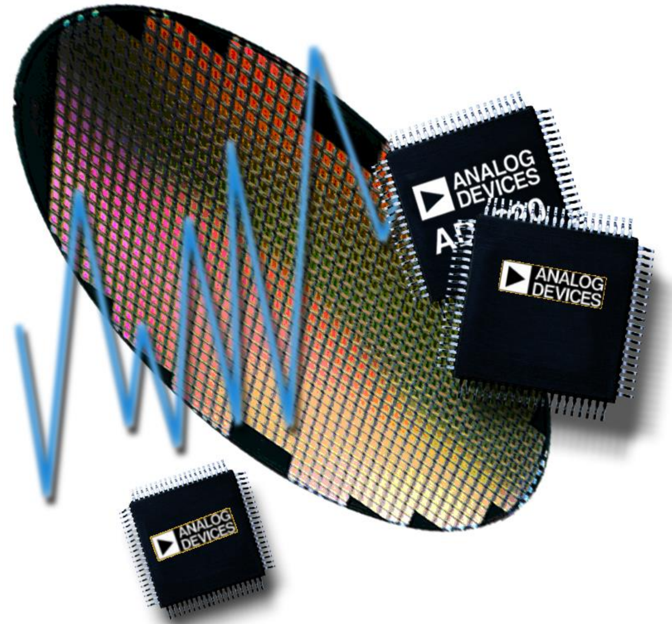

Reliability Report

Report Title: ADL8107 Metal Mask Change Qualification

Report Number: 23152

Revision: A

Date: 6 November 2024

Summary

This report documents the successful completion of the reliability qualification requirements for the release of the ADL8107 product in an 8-LFCSP package. The ADL8107 is a gallium arsenide (GaAs), monolithic microwave IC (MMIC), pseudomorphic high electron mobility transistor (pHEMT), low noise, wideband, high linearity amplifier that operates from 6 GHz to 18 GHz.

Die/Fab Product Characteristics

Table 1: Die/Fab Product Characteristics

Product Characteristics	Product
Generic	ADL8107
Die Id	GP675
Die Size (mm)	0.95 x 0.95
Wafer Fabrication Site	WinSemi
Wafer Fabrication Process	pHEMT
Die Substrate	GaAs
Metallization / # Layers	Au/2
Passivation	SiN

Die/Fab Test Results

Table 2: Die/Fab Test Results

Test Name	Spec	Conditions	Generic	Lot #	Fail/SS
High Temperature Operating Life (HTOL)[1]	JESD22-A108	150°C<Tj<175°C, Biased, 1,000 Hours	HMC8412LP2FE	Q14487.HO1	0/77
				Q14487.HO2	0/77
				Q14487.HO3	0/77
			HMC8413LP2FE	Q14497.HO5	0/77
			ADL8104	Q18823.1.HO2	0/77
			HMC8411	Q18823.1.HO1	0/77
				Q18823.1.HO3	0/77
			HMC8413	Q18823.1.HO5	0/77
				Q18823.1.HO6	0/77
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	HMC8411LP2FE	Q14156.HS1	0/77
			HMC8412LP2FE	Q14487.HS1	0/77
			HMC8413LP2FE	Q14497.HS1	0/77
			ADL8104	Q18823.1.HS1	0/77
				Q18823.1.HS2	0/77
			HMC8411	Q21525.1.HT1	0/77

[1] 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.

Package/Assembly Product Characteristics

Table 3: Package/Assembly Product Characteristics

Product Characteristics	Product
Generic	ADL8107
Package	8-LFCSP
Body Size (mm)	2.00 x 2.00 x 0.85
Assembly Location	ASE
MSL/Peak Reflow Temperature(°C)	1 / 260°C
Mold Compound	Sumitomo G700LYT
Die Attach	Hitachi EN 4900GC conductive
Leadframe Material	Copper
Lead Finish	Ni/Pd/Au
Wire Bond Material/Diameter (mils)	MKE R 2N Gold / 1.00

Package/Assembly Test Results

Table 4: Package/Assembly Test Results

Test Name	Spec	Conditions	Generic	Lot #	Fail/SS
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	ADEMA127	Q22104.1.1	0/77
				Q22104.1.2	0/77
			ADL8103	Q21406.1.HS1	0/77
			ADL8109	Q21358.1.HS1	0/77
			ADL8122	Q21694.1.HS1	0/77
			HMC8411	Q21525.1.HT1	0/77
		-55°C, 1,000 Hours	HMC8411	Q21525.1.LT1	0/77
				Q21525.2.LT2	0/77
				Q21525.3.LT3	0/77
			HMC8413	Q21120.1.LTS	0/77
Solder Heat Resistance (SHR)	J-STD-020	MSL-1	ADL8107	Q23152.1.SH1	0/30
Temperature Cycling (TC)[1]	JESD22-A104	-65°C/+150°C, 1,000 Cycles	ADH8412S	Q21111.1.TCT	0/77
				Q21111.2.TCT	0/77
				Q21111.3.TCT	0/77
			ADL8109	Q21358.1.TC1	0/77
				Q21358.2.TC2	0/77
				Q21358.3.TC3	0/77
			ADL8140	Q22655.1.TC1	0/77
				Q22655.3.TC3	0/77
			HMC8411	Q21525.1.TC1	0/77
				Q21525.3.TC3	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.

ESD Test Results

Table 5: ESD Test Result

ESD Model	Generic	Package	ESD Test Spec	RC Network	Highest Pass Level	Class
FICDM	ADL8107	8-LFCSP	JS-002	1Ω, Cpkg	±500V	C2a
HBM	ADL8107	8-LFCSP	JS-001	1.5kΩ, 100pF	±250V	1A

Approvals

Reliability Engineer: Carl Bunis