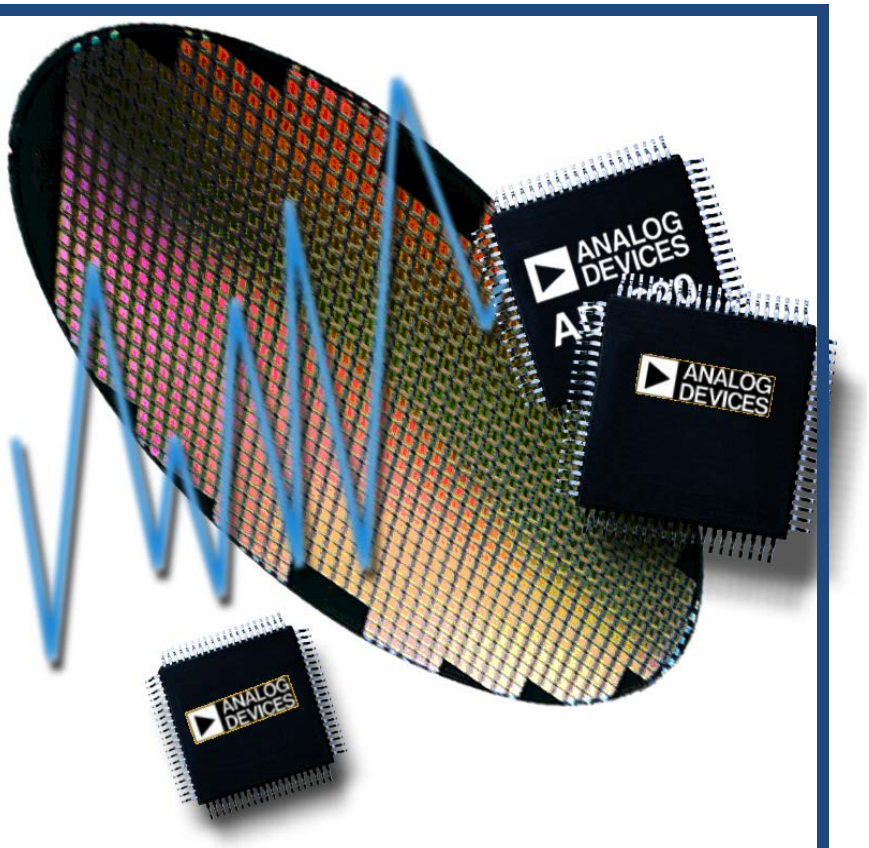

Reliability Report

Report Title: ADPA7006Chip New Product Qualification

Report Number: 16366

Revision: A

Date: 13 December 2021

Summary

This report documents the successful completion of the reliability qualification requirements for the release of the ADPA7006 product. The ADPA7006 is a gallium arsenide (GaAs), pseudomorphic high electron mobility transfer (pHEMT), monolithic microwave integrated circuit (MMIC), with up to 29 dBm of output P1dB. The ADPA7006 has an integrated temperature compensated on-chip power detector that operates between 18 GHz and 44 GHz.

Table 1: ADPA7006 Product Characteristics

Die/Fab

Die Id	FP242/B
Die Size (mm)	2.50 x 2.50
Wafer Fabrication Site	WinSemi

Description / Results of Tests Performed

Table 2 provides a description of the qualification tests conducted and the associated test results for products manufactured on the same technologies as described in Table 1. All devices were electrically tested before and after each stress. Any device that did not meet all electrical data sheet limits following stressing would be considered a valid (stress-attributable) failure unless there was conclusive evidence to indicate otherwise.

Table 2: GaAs pHEMT at WinSemi Fab Qualification Test Results

Test Name	Specification	Conditions	Device	Lot #	Sample Size	Qty. Failures
High Temperature Operating Life (HTOL)	JESD22-A108	125°C<Tj<135°C, Biased, 1,000 Hours	HMC907APM5E	Q12971.1	45	0
				Q12971.3	45	0
			HMC994APM5E	Q12726.10	45	0
		135°<Tj<150°C, 1,000 Hours		Q12726.25	45	0
		150°C<Tj<175°C, Biased, 1,000 Hours	HMC5622ALSH7	Q11814.11	77	0
				Q11814.12	77	0
				Q11814.13	77	0
			HMC797APM5E	Q12907.11	45	0
				Q12907.12	45	0
			HMC906A	Q12910.3	45	0
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	ADPA7006	Q16366.HS1	77	0
			HMC797APM5E	Q12907.3	45	0
			HMC906A	Q12910.1	77	0
			HMC907APM5E	Q12971.HS1	45	0

Samples of the many devices manufactured with these package and process technologies are continuously undergoing reliability evaluation as part of the ADI Reliability Monitor Program. Additional qualification data is available on Analog Devices' web site.

ESD Test Results

The results of Human Body Model (HBM) and Field-Induced Charged Device Model (FICDM) ESD testing are 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: ADPA7006 ESD Test Results

ESD Model	Package	ESD Test Spec	RC Network	Highest Pass Level	First Fail Level	Class
FICDM	16-LCC_HS	JS-002	1Ω, Cpkg	±750V	NA	C2b
HBM	16-LCC_HS	ESDA/JEDEC JS-001	1.5kΩ, 100pF	±500V	NA	1B

Approvals

Reliability Engineer: Carl Bunis

Additional Information

Data sheets and other additional information are available on Analog Devices' web site