



# ***Reliability Report***

**Report Title:** ADPA7005 New Product Qualification

**Report Number:** 18482

**Revision:** A

**Date:** 21 April 2023

## Summary

This report documents the successful completion of the reliability qualification requirements for the release of the ADPA7005 product in an 18-LCC\_HS package. The ADPA7005 is a gallium arsenide (GaAs), pseudomorphic high electron mobility transistor (pHEMT), monolithic microwave integrated circuit (MMIC), 32 dBm saturated output power (PSAT), >1 W, power amplifier, with an integrated temperature compensated, on chip power detector that operates between 18 GHz and 44 GHz.

## Die/Fab Product Characteristics

**Table 1: Die/Fab Product Characteristics**

<b>Product Characteristics</b>	<b>Product</b>
Generic	ADPA7005
Die Id	N2301
Die Size (mm)	3.50 x 3.50
Wafer Fabrication Process	GaAs pHEMT
Die Substrate	GaAs
Passivation	SiN

**Die/Fab Test Results**
**Table 2: Die/Fab Test Results - GaAs pHEMT**

Test Name	Spec	Conditions	Generic	Lot #	Fail/SS
High Temperature Operating Life (HTOL)	JESD22-A108	125°C<Tj<135°C, Biased, 1,000 Hours	HMC907APM5E	Q12971.1	0/45
				Q12971.3	0/45
			HMC994APM5E	Q12726.10	0/45
				Q12726.25	0/45
		150°C<Tj<175°C, Biased, 1,000 Hours	HMC797APM5E	Q12907.11	0/45
				Q12907.12	0/45
			HMC906A	Q12910.3	0/45
			HMC5622ALSH7	Q11814.11	0/77
				Q11814.12	0/77
				Q11814.13	0/77
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	ADPA7002	Q13958.HS1	0/77
			ADPA7005	Q16365.HS1	0/77
			ADPA7006	Q16366.HS1	0/77
			ADPA7007	Q13969.HS1	0/77

## Package/Assembly Product Characteristics

**Table 3: Package/Assembly Product Characteristics - 18-LCC\_HS**

<b>Product Characteristics</b>	<b>Product</b>
Generic	ADPA7005
Package	18-LCC_HS
Body Size (mm)	7.00 x 7.00 x 1.32
MSL/Peak Reflow Temperature(°C)	3 / 260°C
Mold Compound	N/A
Die Attach	Namics XH9890-6A
Leadframe Material	Alumina Ceramic
Lead Finish	NiAu
Wire Bond Material/Diameter (mils)	4N Gold / 1.00

**Package/Assembly Test Results**
**Table 4: Package/Assembly Test Results - LCC\_HS**

Test Name	Spec	Conditions	Generic/Root Part #	Lot #	Fail/SS
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	ADPA7002	Q13958.HS1	0/77
			ADPA7005	Q16365.HS1	0/77
			ADPA7006	Q16366.HS1	0/77
			ADPA7007	Q13969.HS1	0/77
Solder Heat Resistance (SHR)	J-STD-020	MSL-3	ADPA7005	Q18482.1.SH1	0/30
Temperature Cycling (TC) <sup>1</sup>	JESD22-A104	-65°C/+150°C, 500 Cycles	ADPA7002	Q13958.6	0/77
				Q13958.TC1	0/77
			ADPA7005	Q13992.7	0/77
				Q16365.TC1	0/77
			ADPA7006	Q13993.TC1	0/77
				Q16366.TC1	0/77
			ADPA7007	Q13969.TC1	0/77
			HMC7229LS6	Q11686.4	0/77
Q11686.5	0/77				

<sup>1</sup> 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.

## 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	ADPA7005	18-LCC_HS	JS-002	1Ω, Cpkg	±500V	C2a
HBM	ADPA7005	18-LCC_HS	ESDA/JEDEC JS-001	1.5kΩ, 100pF	±250V	1A

## Approvals

Reliability Engineer: Carl Bunis