



Product/Process Change Notice - PCN 23_0129 Rev. -

Analog Devices, Inc. One Analog Way, Wilmington, MA 01887, USA

This notice is to inform you of a change that will be made to certain ADI products (see Appendix A) that you may have purchased in the last 2 years. **Any inquiries or requests with this PCN (additional data or samples) must be sent to ADI within 30 days of publication date.** ADI contact information is listed below.

PCN Title:	ADPA7002 Die and Data Sheet Revision
Publication Date:	09-Jun-2023
Effectivity Date:	11-Sep-2023 <i>(the earliest date that a customer could expect to receive changed material)</i>
Revision Description:	Initial Release.

Description Of Change:

1. Modified die to increase detector range.
2. Data sheet changes:
-->The HBM ESD range will change from 500V to 125 V.

Reason For Change:

1. Die changed to improve RF detector performance.
2. Data sheet is being revised to reflect actual performance.

Impact of the change (positive or negative) on fit, form, function & reliability:

No change to fit form or function. Improved RF detector performance.

Summary of Supporting Information:

Qualification has been performed per Industry Standard Test Methods. See attached Qualification Report.
Data sheet changes will be reflected in Product ADPA7002CHIP data Sheet Rev D and ADPA7002 data sheet Rev A.

Supporting Documents

Attachment 1: Type: Qualification Results Summary

[ADI_PCN_23_0129_Rev_-_ADPA7002_Qualification_Report.pdf...](#)

Attachment 2: Type: Datasheet Specification Comparison

[ADI_PCN_23_0129_Rev_-_ADPA7002_Specification_Changes.pdf...](#)

Note: If applicable, the device material declaration will be updated due to material change.

ADI Contact Information:

For questions on this PCN, please send an email to the regional contacts below or contact your local ADI sales representatives.

Americas:	Europe:	Japan:	Rest of Asia:
PCN_Americas@analog.com	PCN_Europe@analog.com	PCN_Japan@analog.com	PCN_ROA@analog.com

Appendix A - Affected ADI Models:

Added Parts On This Revision - Product Family / Model Number (3)

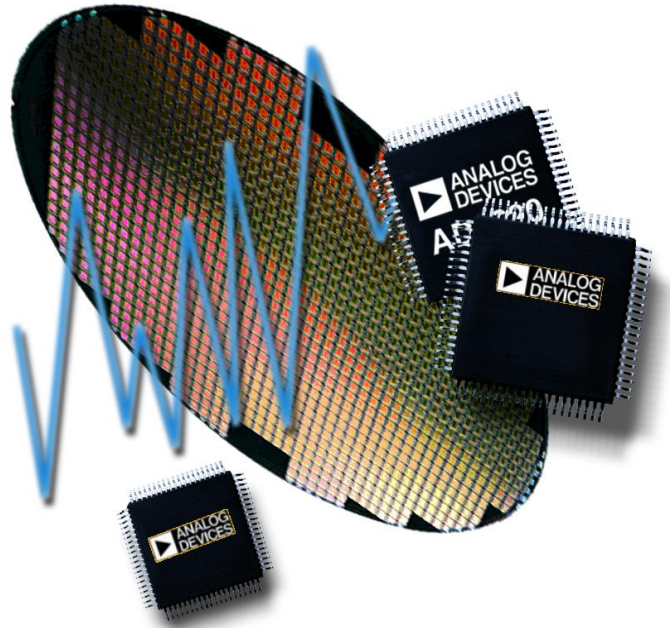
ADPA7002 / ADPA7002AEHZ

ADPA7002 / ADPA7002AEHZ-R7

ADPA7002 / ADPA7002CHIP

Appendix B - Revision History:

Rev	Publish Date	Effectivity Date	Rev Description
Rev. -	09-Jun-2023	11-Sep-2023	Initial Release.



Reliability Report

Report Title: ADPA7002 Improved Detector Circuit
Revision Qualification

Report Number: 19548

Revision: A

Date: 31 May 2023

Summary

This report documents the successful completion of the reliability qualification requirements for the release of the ADPA7002 product in a 16-LCC_HS package. The ADPA7002 is a gallium arsenide (GaAs), monolithic microwave integrated circuit (MMIC), pseudomorphic high electron mobility transistor (pHEMT), distributed power amplifier that operates from 20 GHz to 44 GHz.

Die/Fab Product Characteristics

Table 1: Die/Fab Product Characteristics

Product Characteristics	Product
Generic	ADPA7002
Die Id	DP964 B
Die Size (mm)	1.80 x 2.75
Wafer Fabrication Process	GaAs
Die Substrate	GaAs
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<T _j <175°C, Biased, 1,000 Hours	HMC5622A	Q11814.11	0/77
				Q11814.12	0/77
				Q11814.13	0/77
			HMC994A	Q12726.10	0/45
				Q12726.25	0/45
			HMC906A	Q12910.3	0/45
		HMC797A	Q12907.11	0/45	
			Q12907.12	0/45	
		T _j =125°C, Biased, 1,000 Hours	HMC907A	Q12971.1	0/45
				Q12971.3	0/45
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	ADPA7002	Q13958.HS1	0/77
				Q17419.1.HS1	0/45
				Q17419.1.HS4	0/45
				Q17419.1.HS6	0/77
			ADPA7005	Q16365.HS1	0/77
			ADPA7006	Q16366.HS1	0/77
			ADPA7007	Q13969.HS1	0/77
			HMC907AG	Q17514.1.HS1	0/77
				Q17514.2.HS2	0/77
				Q17514.3.HS3	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	ADPA7002
Package	16-LCC_HS
Body Size (mm)	6.00 x 6.00 x 1.32
MSL/Peak Reflow Temperature(°C)	3 / 260°C
Mold Compound	N/A
Die Attach	Sintered Ag Conductive
Leadframe Material	Alumina
Lead Finish	Au
Wire Bond Material/Diameter (mils)	4N Gold / 1.0

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	ADPA7002	Q13958.HS1	0/77
				Q17419.1.HS1	0/45
				Q17419.1.HS4	0/45
				Q17419.1.HS6	0/77
			ADPA7005	Q16365.HS1	0/77
			ADPA7006	Q16366.HS1	0/77
			ADPA7007	Q13969.HS1	0/77
			HMC7229	Q11686.1	0/45
				Q11686.2	0/45
				Q11686.3	0/45
Solder Heat Resistance (SHR)	J-STD-020	MSL-3	ADPA7002	Q19548.1.SH1	0/30
Temperature Cycling (TC) ¹	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
			HMC7229	Q11686.4	0/77
				Q11686.5	0/77
				Q11686.6	0/77
Q11686.7	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.

ESD Test Results

Table 5: ESD Test Result

ESD Model	Generic	Package	ESD Test Spec	RC Network	Highest Pass Level
FICDM	ADPA7002	16-LCC_HS	JS-002	1Ω, Cpkg	±250V
HBM	ADPA7002	16-LCC_HS	ESDA/JEDEC JS-001	1.5kΩ, 100pF	±125V

Approvals

Reliability Engineer: Carl Bunis

ADPA7002 Die and Data Sheet Revision

ADPA7002 Specification Changes

► New Specifications

► ADPA7002CHIP

► OLD SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS

Table 3.

Parameter	Rating
V_{DDx}	6.0 V
V_{GG1}	-1.6 V to 0 V
RF Input Power (RFIN)	25 dBm
Continuous Power Dissipation (P_{DISS}), $T_A = 85^\circ\text{C}$ (Derate 75.2 mW/°C above 85°C)	6.77 W
Temperature	
Storage Range	-65°C to +150°C
Operating Range	-55°C to +85°C
Nominal Junction ($T_A = 85^\circ\text{C}$, $V_{DD} = 5\text{ V}$, $I_{DQ} = 600\text{ mA}$)	124.9°C
Junction to Maintain 1,000,000 Hour Mean Time to Failure (MTTF)	175°C
Electrostatic Discharge (ESD) Sensitivity	
Human Body Model (HBM)	Class 1A (passed 500 V)

Table 3.

Parameter	Rating
V_{DDx}	6.0 V
V_{GG1}	-1.6 V to 0 V
RF Input Power (RFIN)	25 dBm
Continuous Power Dissipation (P_{DISS}), $T_A = 85^\circ\text{C}$ (Derate 75.2 mW/°C above 85°C)	6.77 W
Temperature	
Storage Range	-65°C to +150°C
Operating Range	-55°C to +85°C
Nominal Junction ($T_A = 85^\circ\text{C}$, $V_{DD} = 5\text{ V}$, $I_{DQ} =$ 600 mA)	124.9°C
Maximum Channel Temperature	175°C
Electrostatic Discharge (ESD) Sensitivity	
Human Body Model (HBM)	Class 0A (passed 125 V)

Stresses not on above those listed under Absolute Maximum Ratings

► New Specifications

► ADPA7002AEHZ

► OLD SPECIFICATIONS

Table 5.

Parameter	Rating
V_{DDX}	6.0 V
V_{GG1}	-1.6 V to 0 V
RF Input Power (RFIN)	25 dBm
Continuous Power Dissipation (P_{DISS}), $T_A = 85^\circ\text{C}$ (Derate 69 mW/°C above 85°C)	6.21 W
Temperature	
Storage Range	-65°C to +150°C
Operating Range	-40°C to +85°C
Nominal Junction ($T_A = 85^\circ\text{C}$, $V_{DD} = 5\text{ V}$, $I_{DQ} = 700\text{ mA}$)	135.75°C
Junction to Maintain 1,000,000 Hour Mean Time to Failure (MTTF)	175°C
Electrostatic Discharge (ESD) Sensitivity	
Human Body Model (HBM)	Class 1A (passed 500 V)

Table 5.

Parameter	Rating
V_{DDX}	6.0 V
V_{GG1}	-1.6 V to 0 V
RF Input Power (RFIN)	25 dBm
Continuous Power Dissipation (P_{DISS}), $T_A = 85^\circ\text{C}$ (Derate 69 mW/°C above 85°C)	6.21 W
Temperature	
Storage Range	-65°C to +150°C
Operating Range	-40°C to +85°C
Nominal Junction ($T_A = 85^\circ\text{C}$, $V_{DD} = 5\text{ V}$, $I_{DQ} = 700\text{ mA}$)	135.75°C
Maximum Channel Temperature	175°C
Electrostatic Discharge (ESD) Sensitivity	
Human Body Model (HBM)	Class 0A (passed 125V V)