Product/Process Change Notice - PCN 22_0217 Rev. -

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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: Moisture Sensitivity Level Rating Change for ADL8142

Publication Date: 21-Sep-2022

Effectivity Date: 21-Sep-2022 *(the earliest date that a customer could expect to receive changed material)*

Revision Description:
Initial Release.

Description Of Change:

Moisture Sensitivity Level (MSL) rating is being changed from MSL3 to MSL1 for ADL8142.

Reason For Change:

The MSL rating is being changed from MSL 3 to MSL 1 to align with reliability qualification.

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

This change does not impact fit, form, function or reliability of the products.

Summary of Supporting Information:

Qualification has been performed per Industry Standard Test Methods. See attached Qualification Results Summary.

Supporting Documents

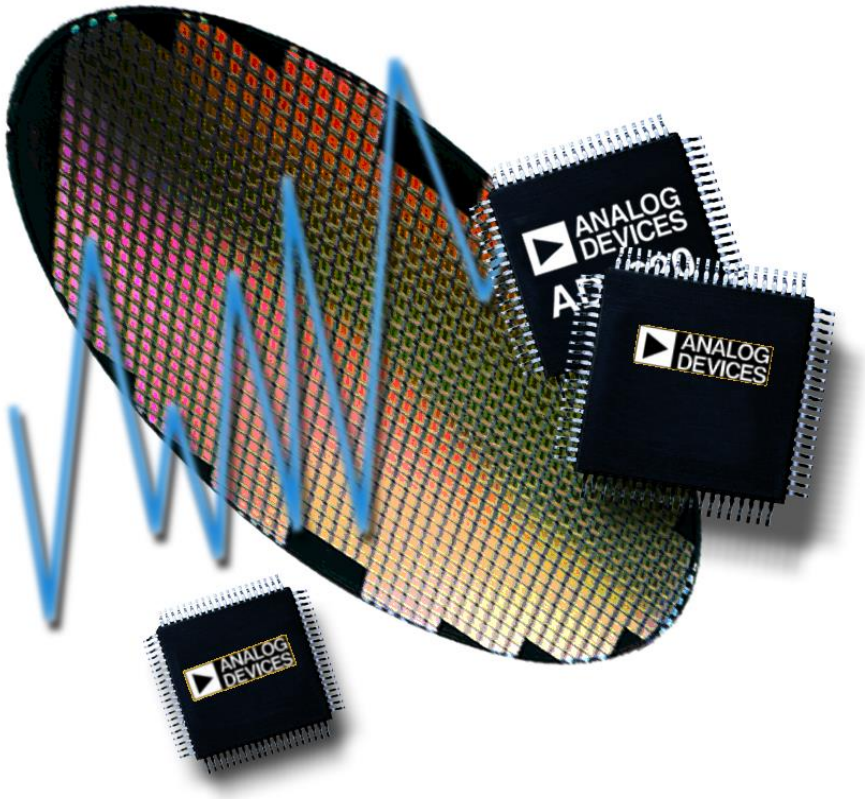
Attachment 1: Type: Qualification Results Summary

ADI_PCN_22_0217_Rev_-_Qualification Results for ADL8142 MSL1 classification.pdf

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 (4)				
ADL8142 / ADL8142ACPZN	ADL8142 / ADL8142ACPZN-R7	ADL8142S / ADL8142ACPZN-CSL	ADL8142S / ADL8142ACPZN-R7-CSL	

Appendix B - Revision History			
Rev	**Publish Date**	**Effectivity Date**	**Rev Description**
Rev. -	21-Sep-2022	21-Sep-2022	Initial Release.



Reliability Report

Report Title: ADL8142 MSL-1 Product Qualification

Report Number: 19790

Revision: A

Date: 16 August 2022

Summary

This report documents the successful completion of the reliability qualification requirements for the release of the ADL8142 product in an 8-LFCSP package. The ADL8142 is a gallium arsenide (GaAs), monolithic microwave integrated circuit (MMIC), pseudomorphic high electron mobility transistor (pHEMT), low noise wideband amplifier that operates from 23 GHz to 31 GHz.

Table 1: ADL8142 Product Characteristics

Die/Fab

Die Id	FP968 A
Die Size (mm)	0.94 x 1.02
Wafer Fabrication Process	GaAs
Passivation Layer	SiN
Bond Pad Metal Composition	Au

Package/Assembly

Package	8-LFCSP
Body Size (mm)	2.00 x 2.00 x 0.85
Assembly Location	ASE
Molding Compound	Sumitomo G700LYT
Lead Frame Material	Copper
Moisture Sensitivity Level	1
Maximum Peak Reflow Temperature (°C)	260

Description / Results of Tests Performed

Table 2 & 3 provide 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: LFCSP Package Qualification Test Results

Test Name	Specification	Conditions	Device	Lot #	Sample Size	Qty. Failures
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	HMC8411LP2FE	Q14156.HS1	77	0
			HMC8412LP2FE	Q14487.HS1	77	0
			HMC8413LP2FE	Q14497.HS1	77	0
Solder Heat Resistance (SHR) [1]	J-STD-020	MSL-1	ADL8142	Q19790.1.SH1	30	0
Temperature Cycling (TC) [1]	JESD22-A104	-65°C/+150°C, 1,000 Cycles	HMC8411LP2FE	Q14156.TC2	77	0
				Q14156.TC3	77	0
			HMC8412LP2FE	Q15087.TC1	77	0
				Q15087.TC2	77	0
				Q15087.TC4	77	0
		-65°C/+150°C, 500 Cycles	ADP7183	Q11648.TC1	77	0
				Q11648.TC2	77	0
				Q11648.TC3	77	0
			ADL8142	Q19790.1.TC1	77	0

[1] These samples were subjected to preconditioning (per J-STD-020 Level 1) prior to the start of the stress test. Level 1 preconditioning consists of the following: Bake: 24 hrs @ 125°C, Unbiased Soak: 168 hrs @ 85°C, 85%RH, Reflow: 3 passes through an oven with a peak temperature of 260°C.

Table 3: GaAs pHEMT Qualification Test Results

Test Name	Specification	Conditions	Device	Lot #	Sample Size	Qty. Failures
High Temperature Operating Life (HTOL)	JESD22-A108	150°C<Tj<175°C, Biased, 1,000 Hours	ADL9005[2]	Q13161.HO1	77	0
				Q13161.HO2	77	0
			HMC8411LP2FE[1]	Q14156.HO1	77	0
				Q14156.HO2	77	0
				Q14156.HO3	77	0
			HMC8412LP2FE[1]	Q14487.HO1	77	0
			HMC8413LP2FE[1]	Q14497.HO5	77	0
			ADL8104[2]	Q16788.H01	77	0
				Q16788.H03	77	0
High Temperature Storage Life (HTSL)	JESD22-A103	150°C, 1,000 Hours	ADL9005	Q13161.HS2	77	0
			HMC8411LP2FE	Q14156.HS1	77	0
			HMC8412LP2FE	Q14487.HS1	77	0
			HMC8413LP2FE	Q14497.HS1	77	0

[1] These samples were subjected to preconditioning (per J-STD-020 Level 1) prior to the start of the stress test. Level 1 preconditioning consists of the following: Bake: 24 hrs @ 125°C, Unbiased Soak: 168 hrs @ 85°C, 85%RH, Reflow: 3 passes through an oven with a peak temperature of 260°C.

[2] These samples were subjected to preconditioning (per J-STD-020 Level 3) prior to the start of the stress test. Level 3 preconditioning consists of the following: Bake: 24 hrs @ 125°C, Unbiased Soak: 192 hrs @ 30°C, 60%RH, Reflow: 3 passes through an oven with a peak temperature of 260°C.

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 Field-Induced Charged Device Model (FICDM) 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 4: ADL8142 ESD Test Results

ESD Model	Package	ESD Test Spec	RC Network	Highest Pass Level	First Fail Level	Class
FICDM	8-LFCSP	JS-002	1Ω, Cpkg	±750V	±1000V	C2B
HBM	8-LFCSP	ESDA/JEDEC JS-001-2011	1.5kΩ, 100pF	±400V	±500V	1A

Approvals

Reliability Engineer: Carl Bunis

Additional Information

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