SINGLE EVENT EFFECTS TEST REPORT ADL8143-CSL

November 2025

Radiation Test Report	
Product:	ADL8143-CSL
Effective LET:	83.2 MeV-cm^2/mg
Fluence:	1E7 Ions/cm^2
Facilities:	TAMU
Tested:	Nov. 3, 2025

The RADTEST® DATA SERVICE is a compilation of radiation test results on Analog Devices' Space grade products. It is designed to assist customers in selecting the right product for applications where radiation is a consideration. Many products manufactured by Analog Devices, Inc. have been shown to be radiation tolerant to most tactical radiation environments. Analog Devices, Inc. does not make any claim to maintain or guarantee these levels of radiation tolerance without lot qualification test.

It is the responsibility of the Procuring Activity to screen products from Analog Devices, Inc. for compliance to Nuclear Hardness Critical Items (HCI) specifications.

Warning:

Analog Devices, Inc. does not recommend use of this data to qualify other product grades or process levels. Analog Devices, Inc. is not responsible and has no liability for any consequences, and all applicable Warranties are null and void if any Analog Devices product is modified in any way or used outside of normal environmental and operating conditions, including the parameters specified in the corresponding data sheet. Analog Devices, Inc. does not guarantee that wafer manufacturing is the same for all process levels.

SEE Test Report for the ADL8143-CSL – 8GHz to 14GHz LNA

Nolan Carr, Braxton Houlden, Jan Miguel, Eric Muire, Jason Sekanina, Tom Decker

Test Date:
November 3, 2025

I. Introduction

The purpose of this test is to determine the heavy ion-induced Single-Event Effects (SEE) susceptibility of the ADL8143-CSL, an 8GHz – 14GHz LNA.

Single Event Latch-up was evaluated with high supply voltage and high temperature with no latch-up or other destructive SEE events observed to the highest LET tested (83.2 MeV-cm^2/mg). The device was evaluated at 125°C using the TAMU heating system (forced air).

II. Device Under Test

The ADL8143-CSL is a low noise amplifier (LNA) that operates from 8GHz to 14 GHz. Typical gain and noise figure are 28.5 dB and 1 dB, respectively, from 8GHz to 10 GHz. Figure 1 shows a functional block diagram of the device. Table 1 shows the basic part and test details. Detailed device parameters and functional descriptions can be found in the datasheet.

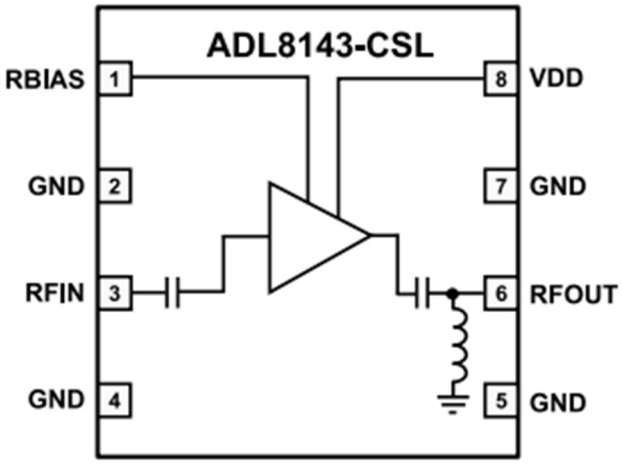

Figure 1. Functional block diagram.

Table 1
Part and test information.

Generic Part Number:	ADL8143
Date of Test:	Nov 3, 2025
Manufacturer:	Analog Devices
Die Revision:	ADL8143
Part Function:	8GHz to 14GHz LNA
Part Technology:	GaAs
Package Style:	8-Ld LFCSP
Interconnect:	Wire-Bonded

III. Test Facilities

The heavy-ion beam testing was carried out at the Texas A&M University Cyclotron Facility. The facility utilizes the K500 cyclotron with a superconducting magnet which generates the magnetic field used to accelerate the ions. The test setup was in an air environment.

Facility: Texas A&M University Cyclotron Facility
Beam: 24.7 A MeV
Flux: up to 1×10^{5} $cm^{-2} \cdot s^{-1}$
Fluence: up to 1×10^{7} cm^{-2} (perrun)
Ions: Ag

IV. Test Method

A. Test Setup

The device under test (DUT) was chemically de-processed to expose the wire-bonded die. The RF input was set to 10 GHz @ -30dBm using a Hittite HMC-T2240 RF Generator. The power supply to the DUT was set to 1.65 V with ~35 mA supply current for SEL and 1.35V with ~32mA supply current for SET. The output was monitored using a Keysight Field Fox Spectrum Analyzer. The power supply current was monitored using Python scripts. The TAMU temp forcing system was used to get the device to 125°C. The test configuration is shown in Figure 2.

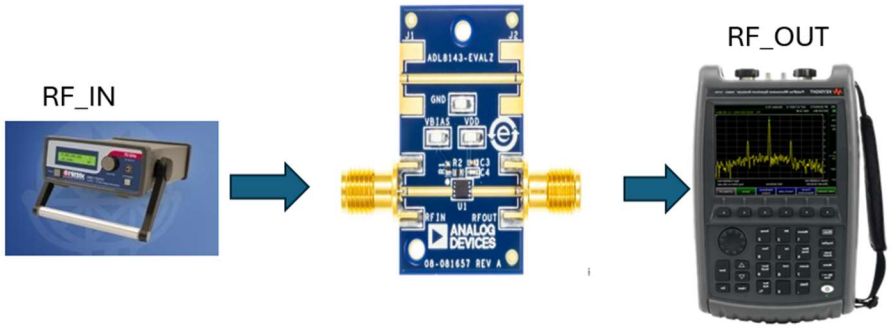

Figure 2: ADL8143 Test Setup

B. Irradiation procedure

1) Turn on power to DUT
2) SEL: Set the temperature of the DUT to 125°C
   SET: Set the temperature of the DUT to room temperature
3) Start power supply current and spectrum analyzer monitoring script
4) Start Beam
5) Stop beam at 1E7 total ions

Test Conditions

Temperature:	**SEL:** 125°C **SET:** 25°C
RF Input Frequency:	10 GHz
Power Supply(s):	**SEL:** 1.65V **SET:** 1.35V
Parameters:	Supply Current RF Output
Samples:	3

V. Results

SEL – The ADL8143 did not exhibit SEL at ≤ 83.2 MeV-cm^2/mg out to 1.0E7 ions/cm^2 while heated to 125°C. The test runs are shown below in Table 2. Plots are shown below in Figures 3-6.

Table 2: SEL Test Runs

Run	Dut	ion	LET (MeVcm^2/mg)	Range(um)	Angle(°)	TID(Rads)	Flux (ions/cm^{2}s)	Fluence (Ions/cm^2)	SEL
Run 18	1	Xe	83.2	70.5	40	13.3k	8.79e4	1.00e7	0
Run 20	2	Xe	83.2	70.5	40	13.3k	8.08e4	9.999e6	0
Run 22	3	Xe	83.2	70.5	40	13.3k	7.36e4	9.977e6	0

SET – The ADL8143 did not exhibit SET at ≤ 83.2 MeV-cm^2/mg out to 1.0E7 ions/cm^2 while at 25°C. The test runs are shown below in Table 3. Plots are shown below in Figures 7-10. Note that the output for DUT 3, on Run 23, was at a different level than DUTs 1 and 2. This was noted before the run and the decision to irradiate was made since the output was stable.

Table 3: SET Test Runs

Run	Dut	ion	LET (MeVcm^2/mg)	Range(um)	Angle(°)	TID(Rads)	Flux (ions/cm^{2}s)	Fluence (Ions/cm^2)	SET
Run 19	1	Xe	83.2	70.5	40	13.3k	8.76e4	9.963e6	0
Run 21	2	Xe	83.2	70.5	40	13.4k	8.499e4	9.998e6	0
Run 23	3	Xe	83.2	70.5	40	13.38k	7.745e4	1.003e7	0

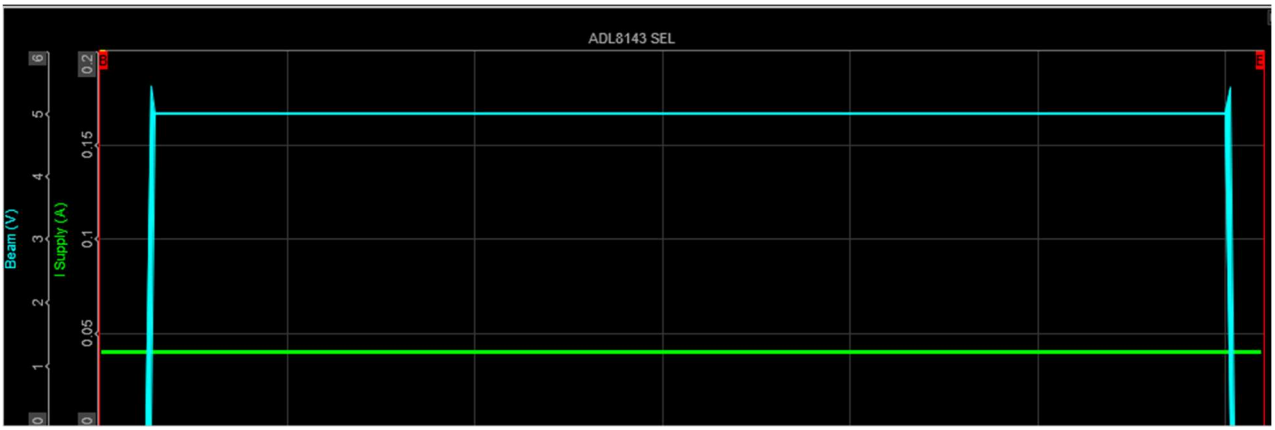

Figure 3: SEL Run 18 Power Supply Current Bd 1

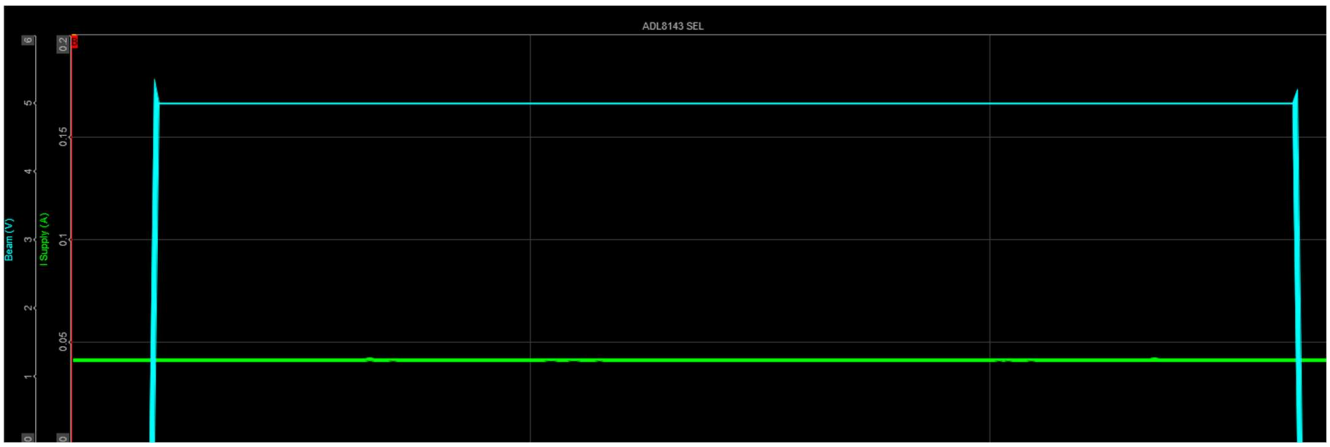

Figure 4: SEL Run 20 Power Supply Current Bd 2

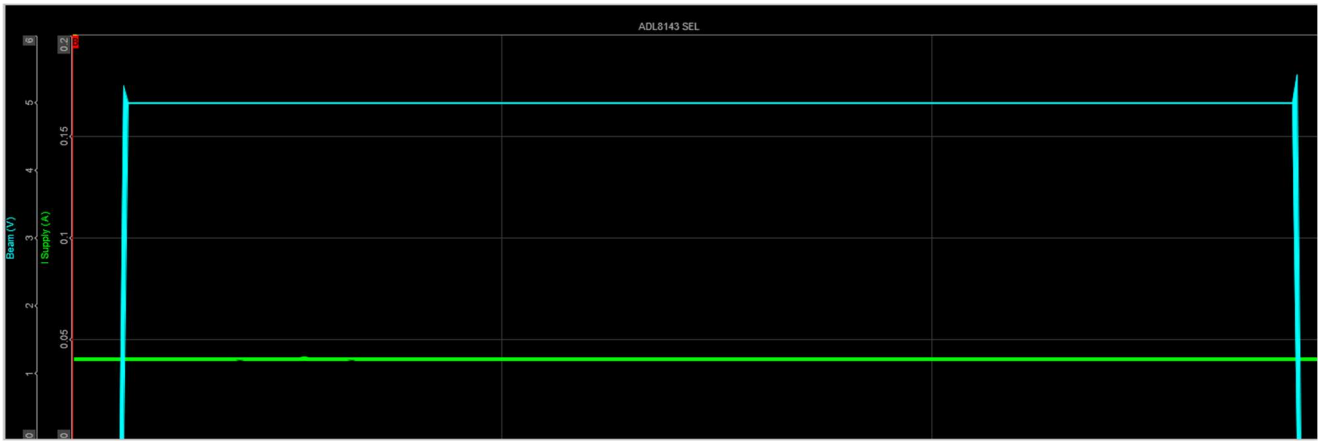

Figure 5: SEL Run 22 Power Supply Current Bd 3

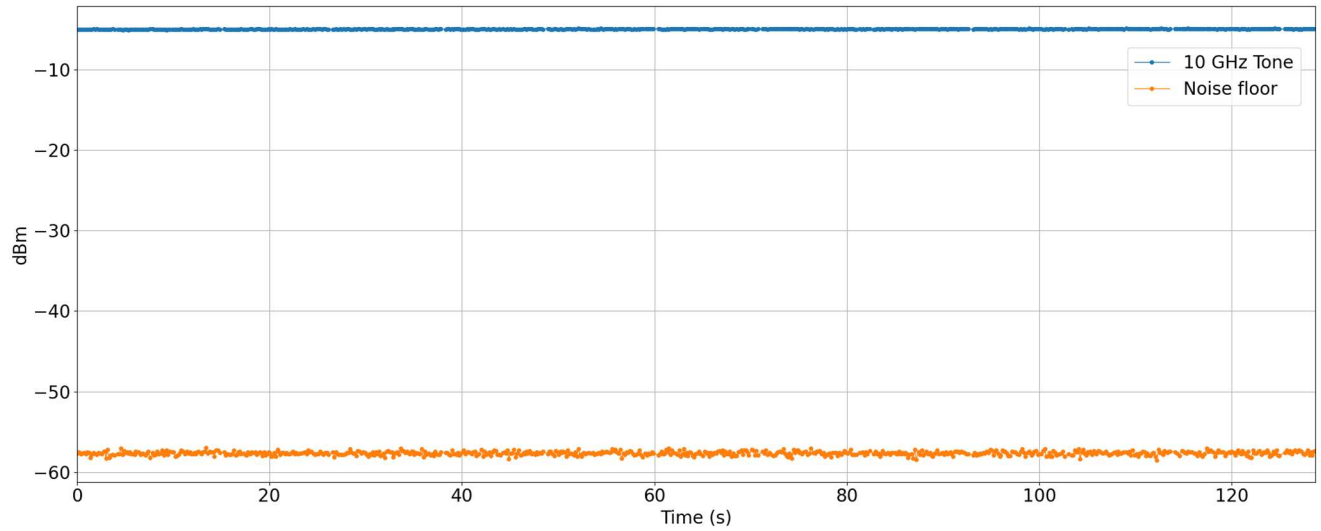

Figure 6: SET Run 19, Bd 1

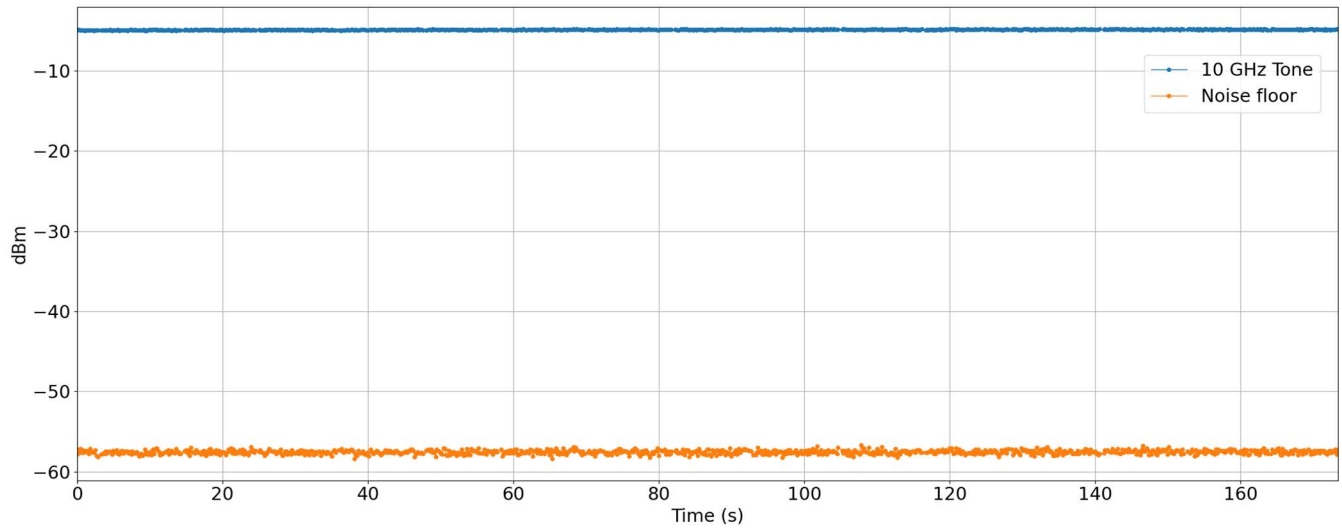

Figure 7: SET Run 21, Bd 2

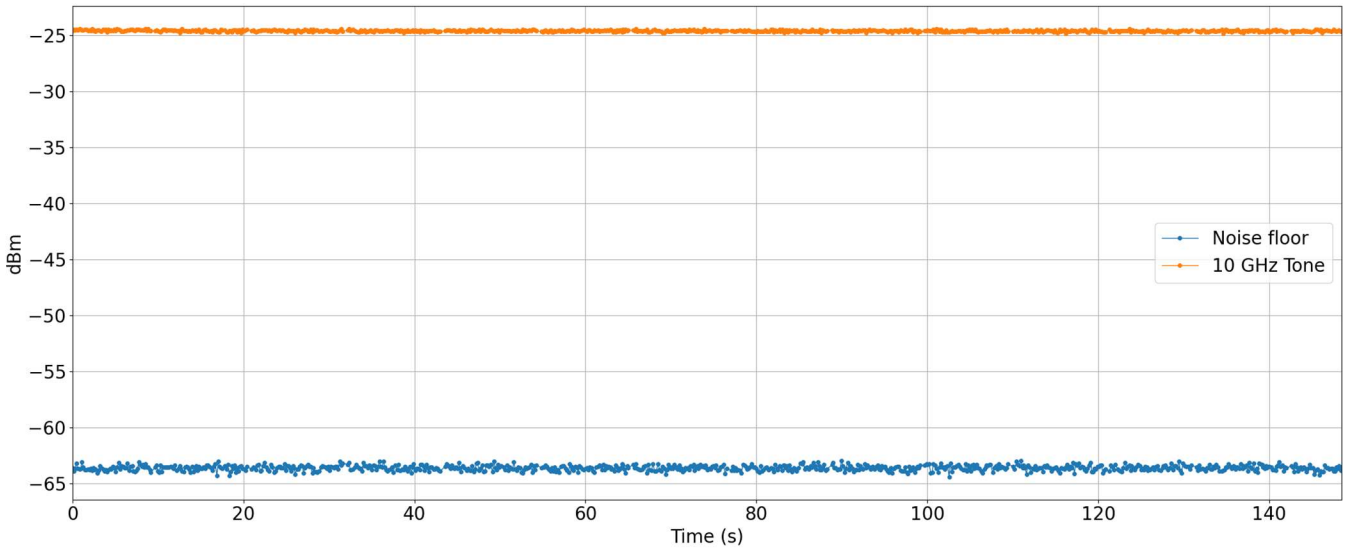

Figure 8: SET Run 23, Bd 3

VI. Conclusion:

The ADL8143 does not exhibit SEL ≤83.2 MeV-cm^2/mg. SET were not detected at the same level.

Table 4: Equipment used and Calibration:

Equipment	Calibration
Keithley 2300G-30-6	SN# 802901012766910023 Calibration due 2/28/26
HMC-T2240	SN#002023 No Cal required – verified using Field Fox
Keysight Field Fox N9552B	SN#MY62151444 Calibration due 9/24/26