

Repeatability Test of OPA4991IDR of TIA Config IAR REPORT

Date: 25/07/2023

TIA Characterization:

The Transimpedance amplifier OPA4991ID was tested and characterized for all 4 channels.

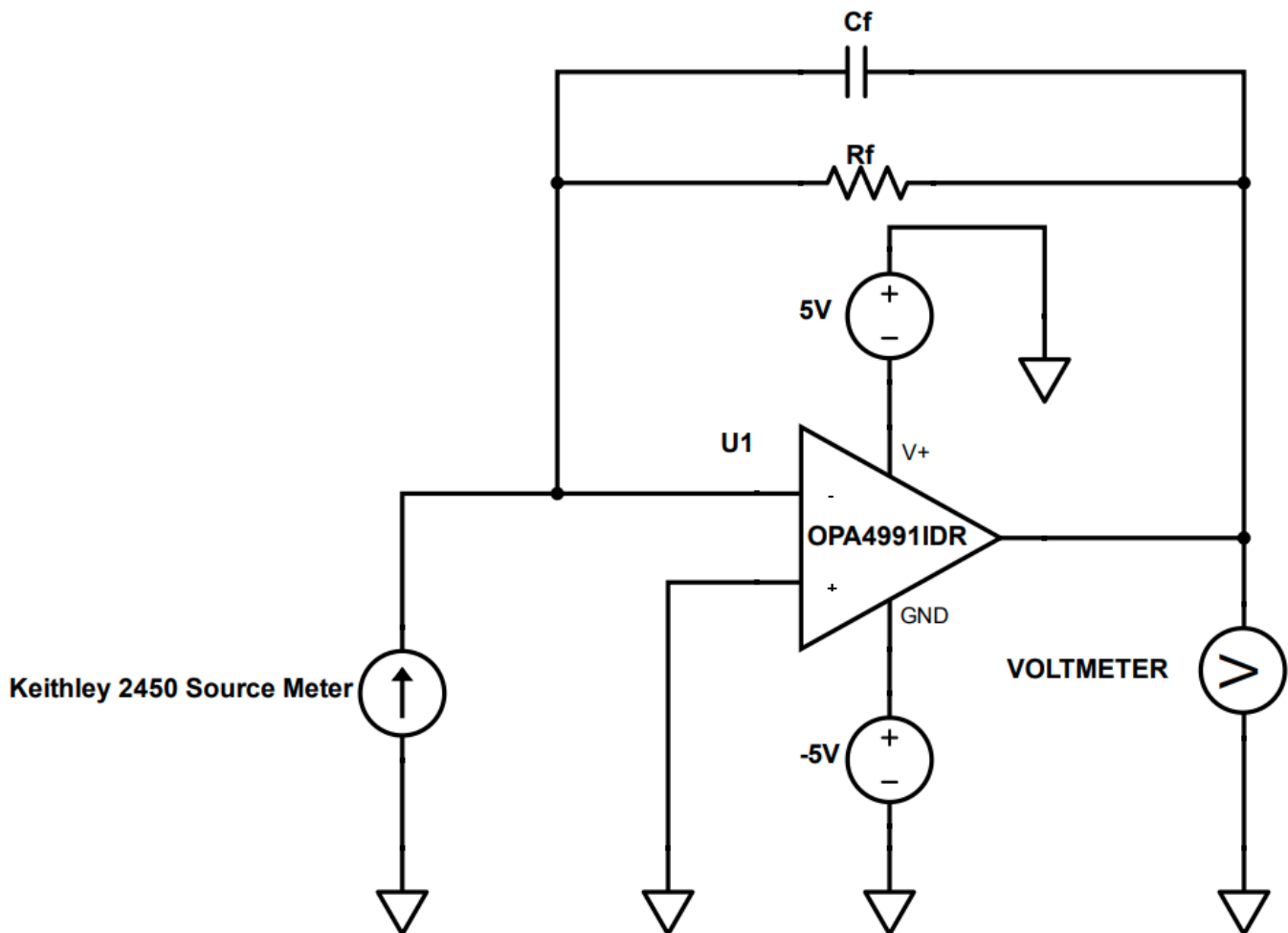
Setup:

A voltage regulator of $-5V$ and $+5V$ was connected to the supply pins of op amp.

The input current was provided through SMU to the inverting terminal.

Non-inverting terminal is connected to ground.

The output voltage was measured through the multimeter.



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Procedure:

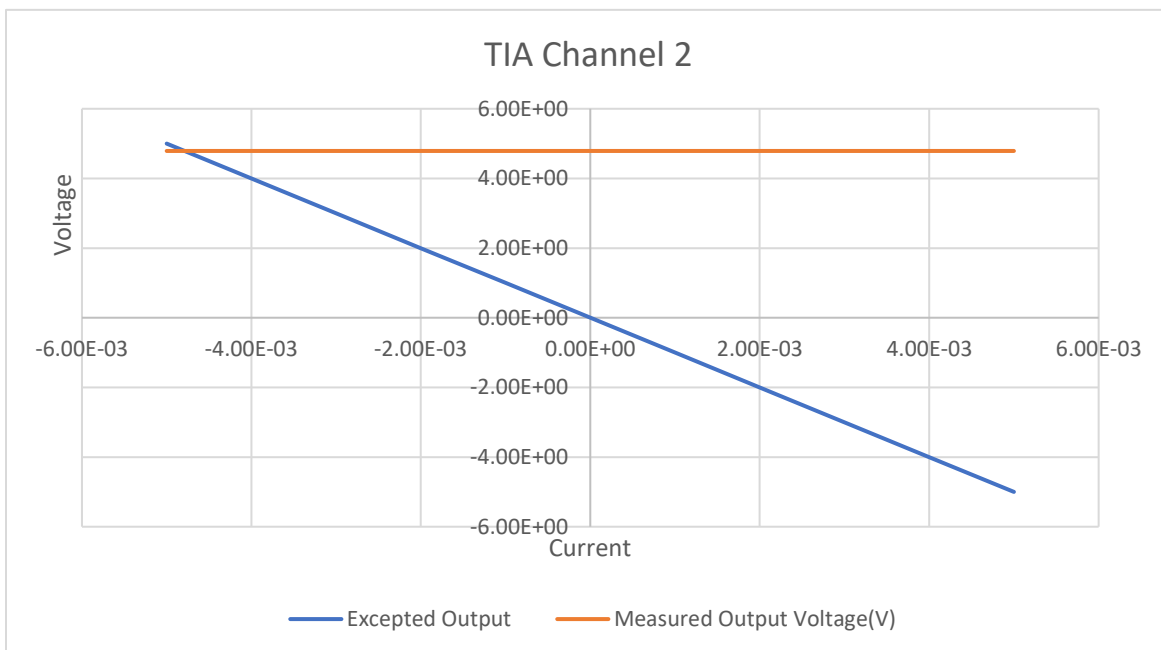
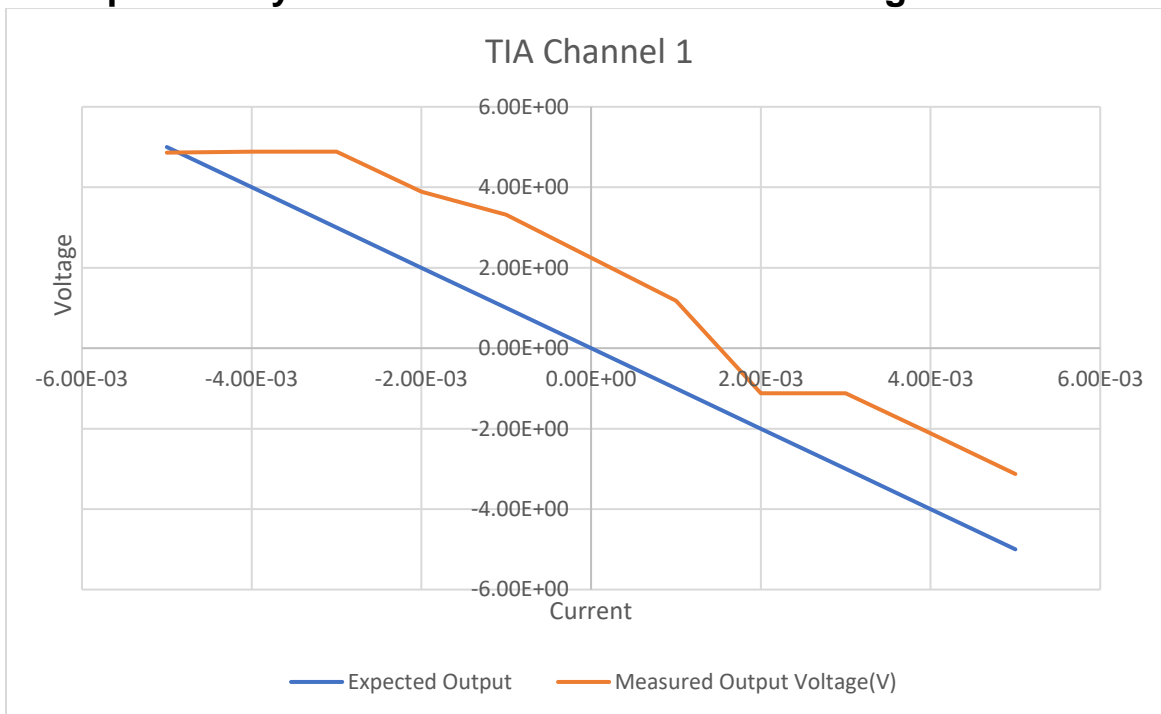
- Make the necessary connections.
- Supply the input current to the inverting terminal of opamp.
- Measure the voltage through multimeter.
- Change the input current and measure output voltage again.

Output:

Gain Resistor, $R_f = 1M\Omega$; Bias Voltage, $V_{bias} = 0V$, $C_f = 120pF$;

TIA Channel 1			TIA Channel 2		
Current(A)	Expected Output Voltage(V)	Measured Output Voltage(V)	Current(mA)	Expected Output Voltage(V)	Measured Output Voltage(V)
-5.00E-03	5.00E+00	4.86484	-5.00E-03	5.00E+00	4.78845
-4.00E-03	4.00E+00	4.88208	-4.00E-03	4.00E+00	4.78846
-3.00E-03	3.00E+00	4.88527	-3.00E-03	3.00E+00	4.78851
-2.00E-03	2.00E+00	3.8877	-2.00E-03	2.00E+00	4.78827
-1.00E-03	1.00E+00	3.32156	-1.00E-03	1.00E+00	4.78826
1.00E-03	-1.00E+00	1.18025	1.00E-03	-1.00E+00	4.78851
2.00E-03	-2.00E+00	-1.12136	2.00E-03	-2.00E+00	4.78864
3.00E-03	-3.00E+00	-1.12256	3.00E-03	-3.00E+00	4.78874
4.00E-03	-4.00E+00	-2.11262	4.00E-03	-4.00E+00	4.78891
5.00E-03	-5.00E+00	-3.12701	5.00E-03	-5.00E+00	4.78877
-5.00E-03	5.00E+00	4.86484	-5.00E-03	5.00E+00	4.78845
-4.00E-03	4.00E+00	4.88208	-4.00E-03	4.00E+00	4.78846
-3.00E-03	3.00E+00	4.88527	-3.00E-03	3.00E+00	4.78851
-2.00E-03	2.00E+00	3.8877	-2.00E-03	2.00E+00	4.78827
-1.00E-03	1.00E+00	3.32156	-1.00E-03	1.00E+00	4.78826
1.00E-03	-1.00E+00	1.18025	1.00E-03	-1.00E+00	4.78851
2.00E-03	-2.00E+00	-1.12136	2.00E-03	-2.00E+00	4.78864
3.00E-03	-3.00E+00	-1.12256	3.00E-03	-3.00E+00	4.78874
4.00E-03	-4.00E+00	-2.11262	4.00E-03	-4.00E+00	4.78891
5.00E-03	-5.00E+00	-3.12701	5.00E-03	-5.00E+00	4.78877

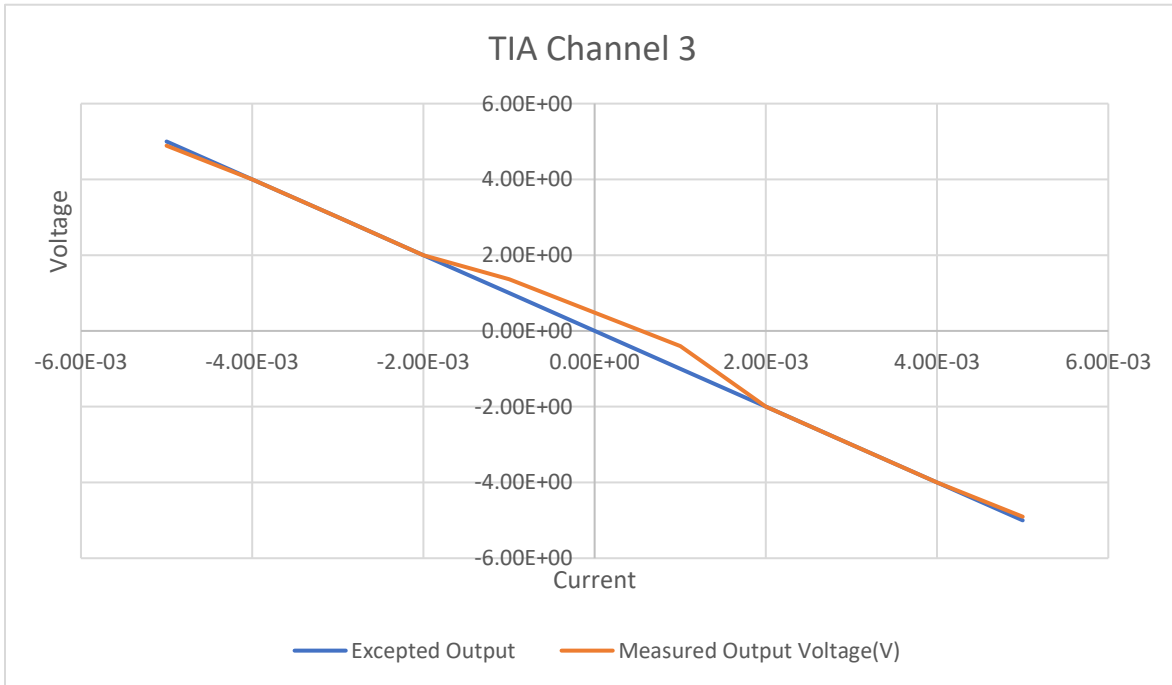
Repeatability Test of OPA4991IDR of TIA Config



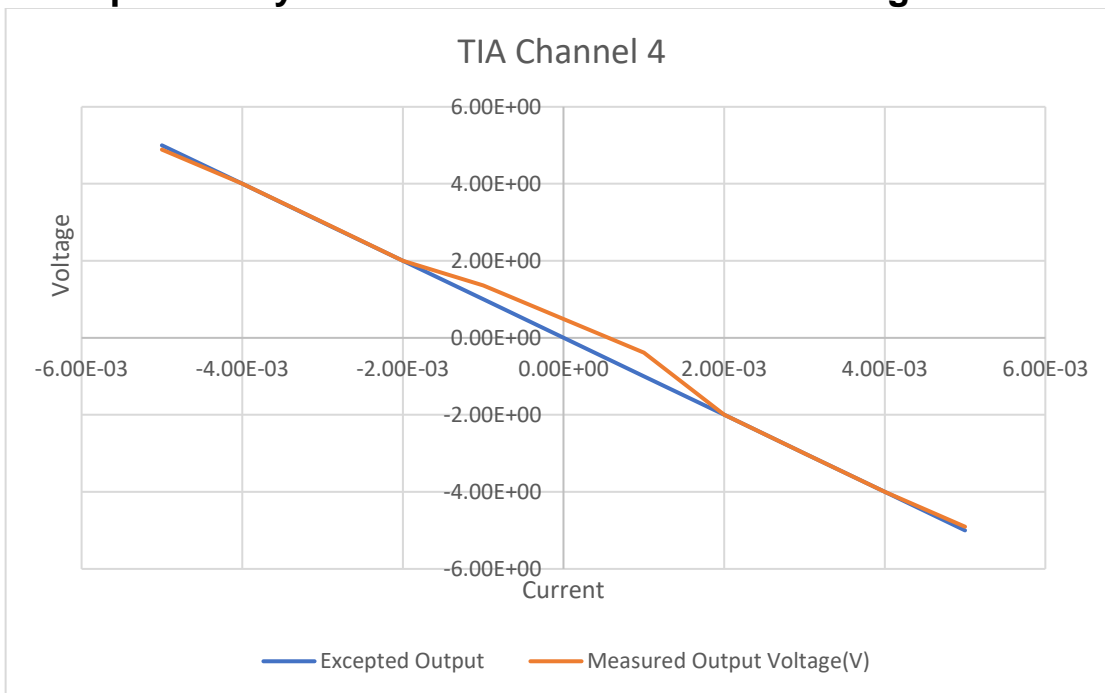
TIA Channel 3			TIA Channel 4			
Current(A)	Expected Output Voltage(V)	Measured Output Voltage(V)		Current(Ma)	Expected Output Voltage(V)	Measured Output Voltage(V)

Repeatability Test of OPA4991DR of TIA Config

-5.00E-03	5.00E+00	4.88946		-5.00E-03	5.00E+00	4.88925
-4.00E-03	4.00E+00	4.00164		-4.00E-03	4.00E+00	4.00386
-3.00E-03	3.00E+00	3.00152		-3.00E-03	3.00E+00	3.00319
-2.00E-03	2.00E+00	2.00157		-2.00E-03	2.00E+00	2.00276
-1.00E-03	1.00E+00	1.36555		-1.00E-03	1.00E+00	1.36286
1.00E-03	-1.00E+00	-0.39732		1.00E-03	-1.00E+00	-0.387857
2.00E-03	-2.00E+00	-1.99884		2.00E-03	-2.00E+00	-1.9956
3.00E-03	-3.00E+00	-2.99881		3.00E-03	-3.00E+00	-3.0022
4.00E-03	-4.00E+00	-3.99881		4.00E-03	-4.00E+00	-4.00081
5.00E-03	-5.00E+00	-4.90392		5.00E-03	-5.00E+00	-4.90439
-5.00E-03	5.00E+00	4.88946		-5.00E-03	5.00E+00	4.88925
-4.00E-03	4.00E+00	4.00164		-4.00E-03	4.00E+00	4.00386
-3.00E-03	3.00E+00	3.00152		-3.00E-03	3.00E+00	3.00319
-2.00E-03	2.00E+00	2.00157		-2.00E-03	2.00E+00	2.00276
-1.00E-03	1.00E+00	1.36555		-1.00E-03	1.00E+00	1.36286
1.00E-03	-1.00E+00	-0.39732		1.00E-03	-1.00E+00	-0.387857
2.00E-03	-2.00E+00	-1.99884		2.00E-03	-2.00E+00	-1.9956
3.00E-03	-3.00E+00	-2.99881		3.00E-03	-3.00E+00	-3.0022
4.00E-03	-4.00E+00	-3.99881		4.00E-03	-4.00E+00	-4.00081
5.00E-03	-5.00E+00	-4.90392		5.00E-03	-5.00E+00	-4.90439



Repeatability Test of OPA4991IDR of TIA Config



Summary: Repeatability Test on 21/07/2023 Shows same response as Test Done on 18/07/2023 with Nonlinearity/Saturation in Channels 1, 2 & Channels 3, 4 showing higher offset for +/-1ma input current.

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