

# **Ohmcraft Resistor Testing**

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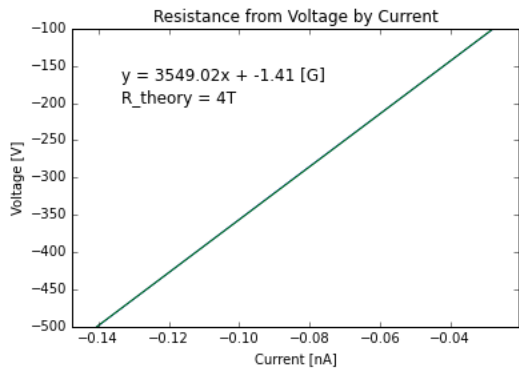
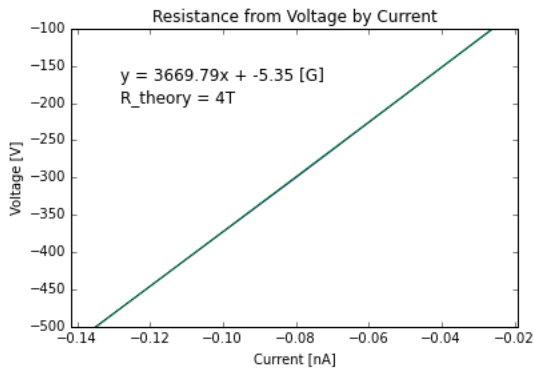
## Resistance Measurements

Each resistor was placed in a simple circuit containing a picoammeter. A negative electric potential difference was set across the resistor and the current was recorded. This was repeated multiple times between -100 V and -500 V. The voltage (in volts) was then plotted as a function of current (in nanoamperes). The slope of the linear best-fit provided an experimental resistance. The **blue** line represents the **data**, while the **green** line is the **linear fit**.

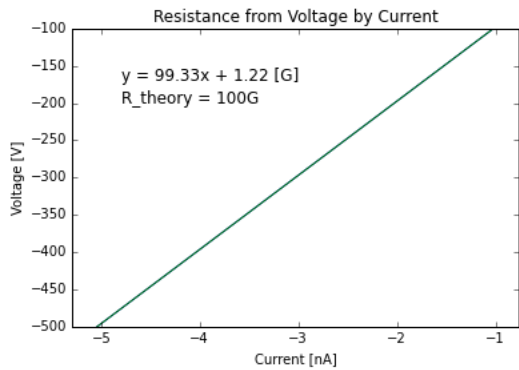
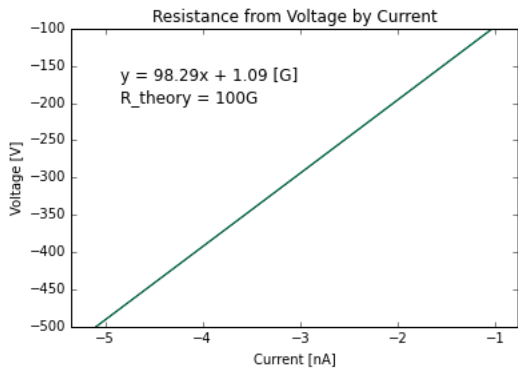
## Current Stability Measurements

Using the data from the resistance testing, current was plotted as a function of time to study the stability of the resistor. All resistors of a specific type were plotted in the same frame at a selected voltage of magnitude 500 V (plots at additional voltages may also be interesting). Please note the scales of the axes, as it can change the perceived stability. Each color line is a different resistor within the same group.

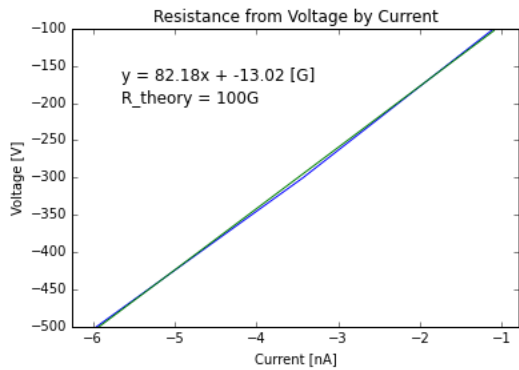
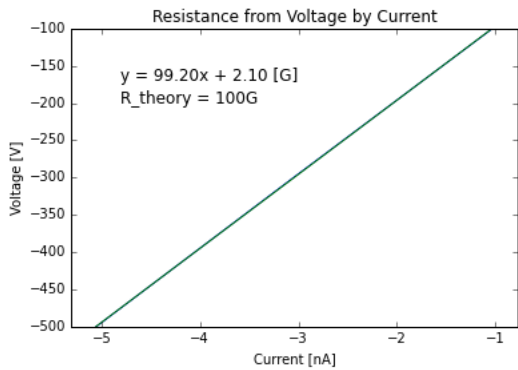
**CN-196-4T; Resistors 1 & 2**

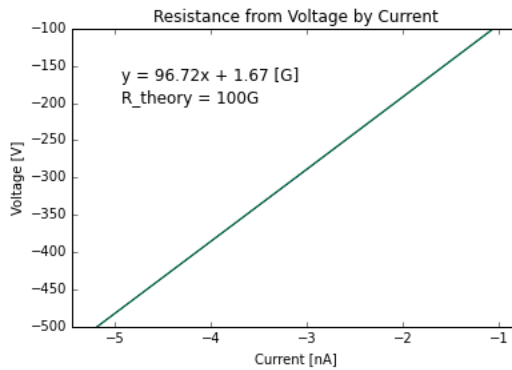
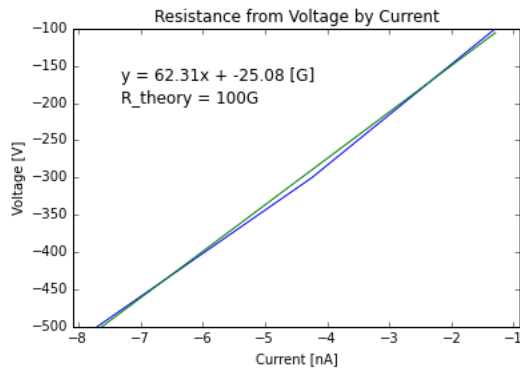
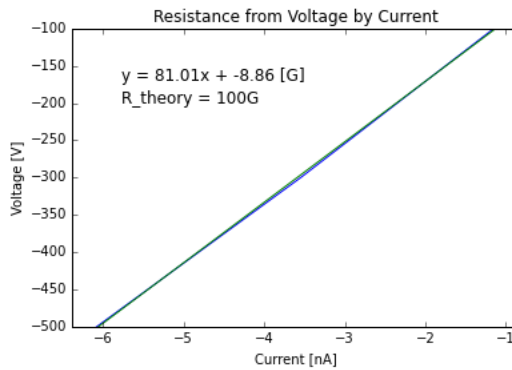
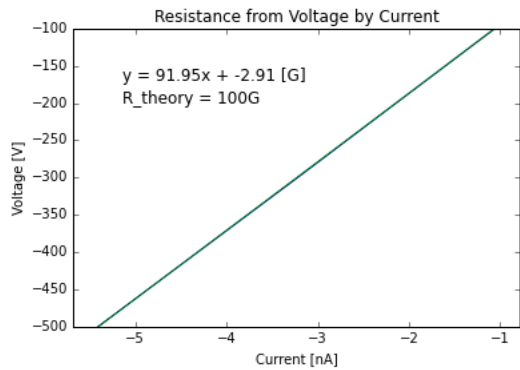
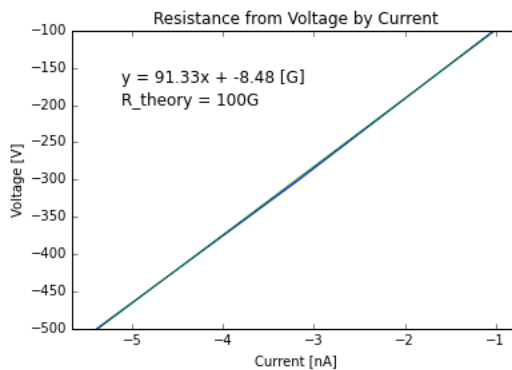
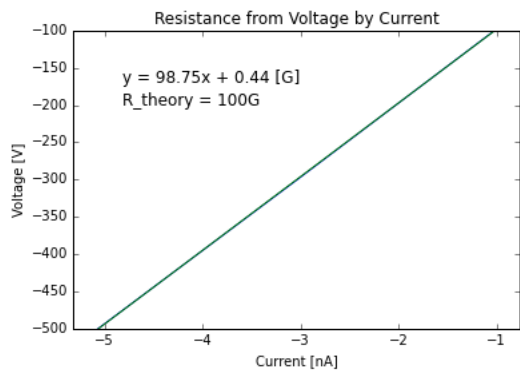


**CN-585B-100G; Resistors 1 & 2**

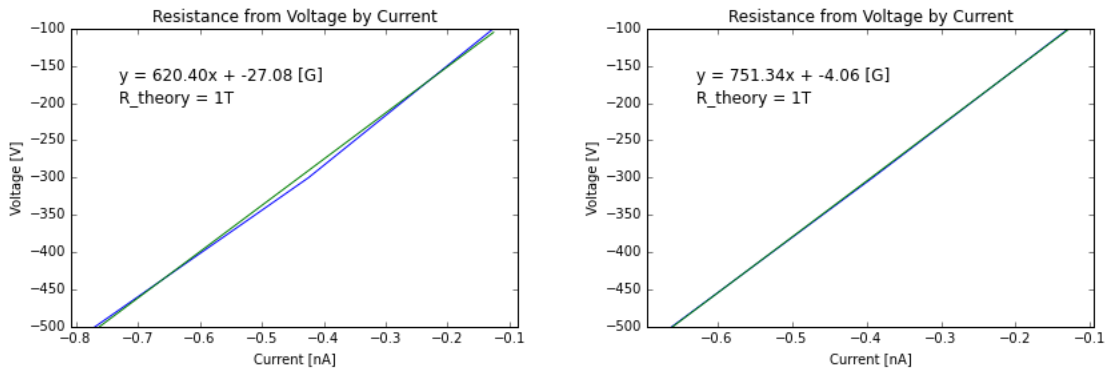


**CN-585B-100G; Resistors 3 & 4**

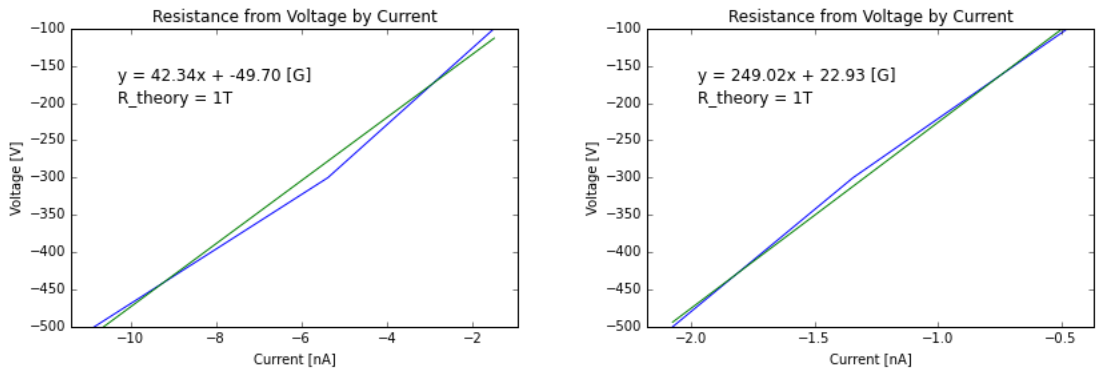


**CN-585B-100G; Resistors 5 & 6****CN-585B-100G; Resistors 7 & 8****CN-585B-100G; Resistors 9 & 10**

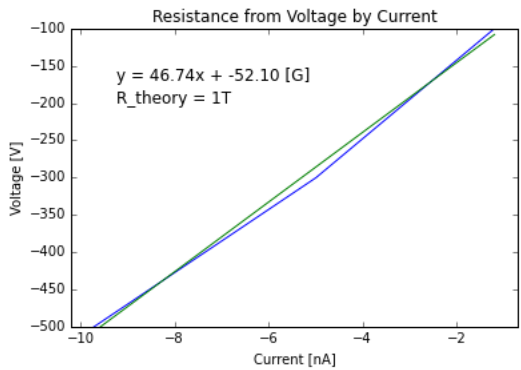
**CN-696-1T; Resistors 1 & 2**



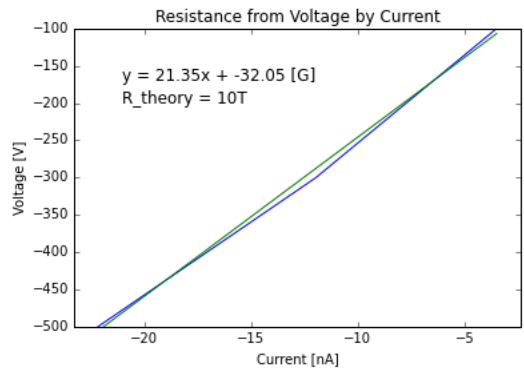
**CN-1213-1T; Resistors 1 & 2**



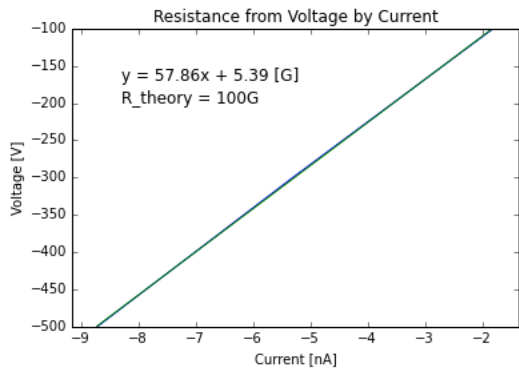
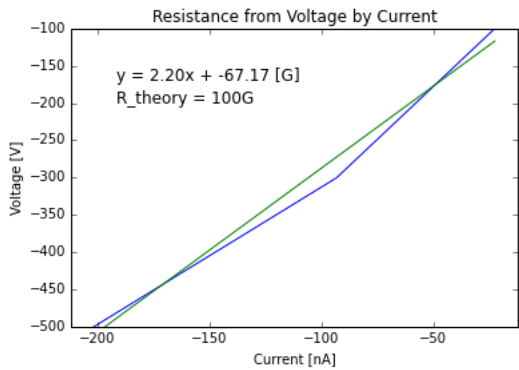
**CN-1217-1T; Resistor 1**



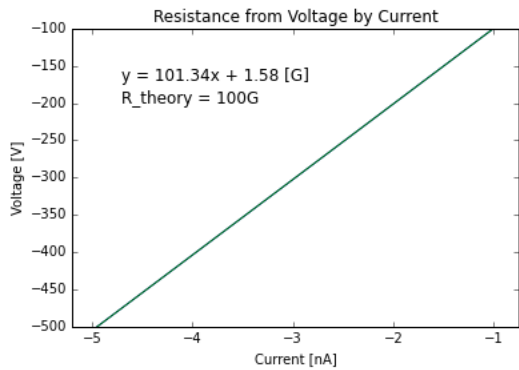
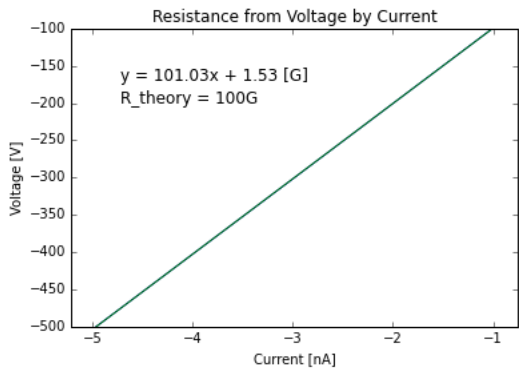
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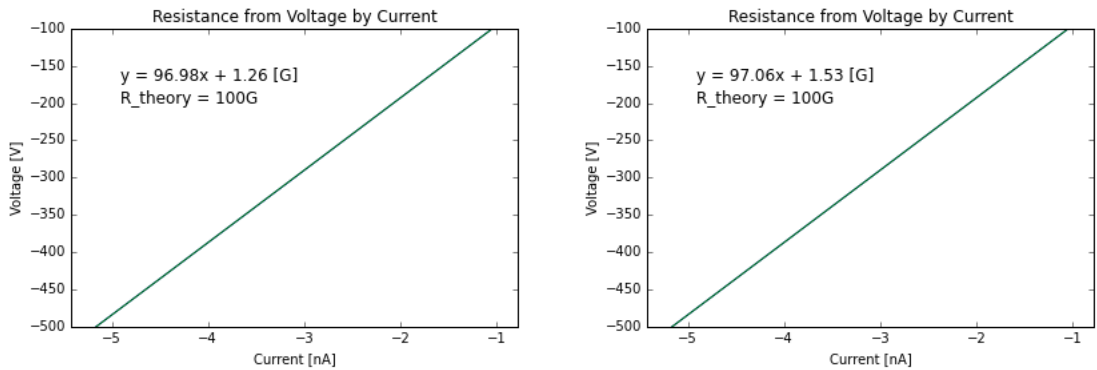
**CN-1217-100G; Resistors 1 & 2**



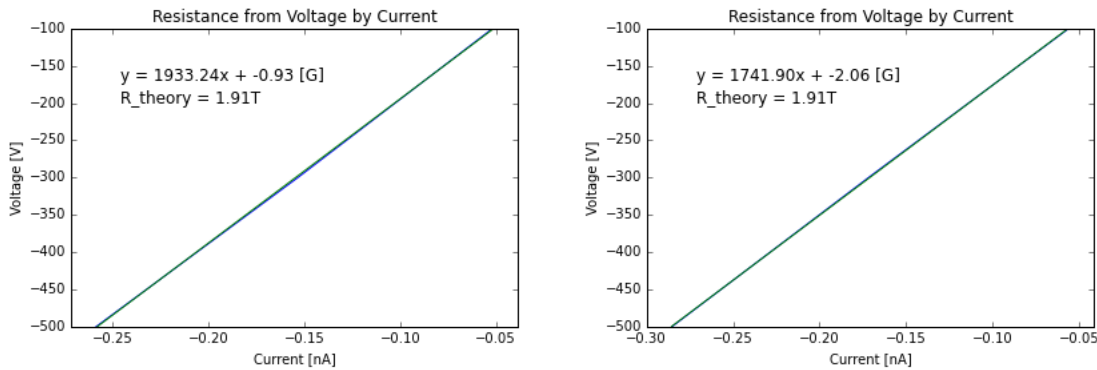
**CR-1213-100G; Resistors 1 & 2**



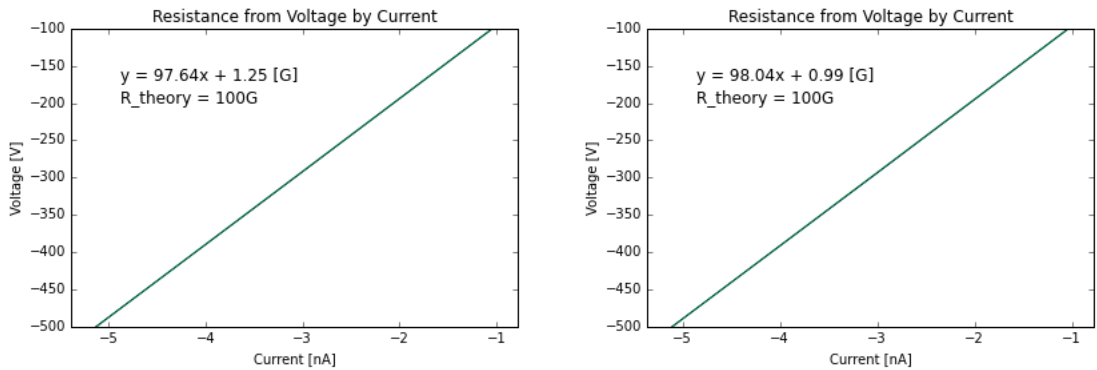
**HVRW42K-100G; Resistors 1 & 2**



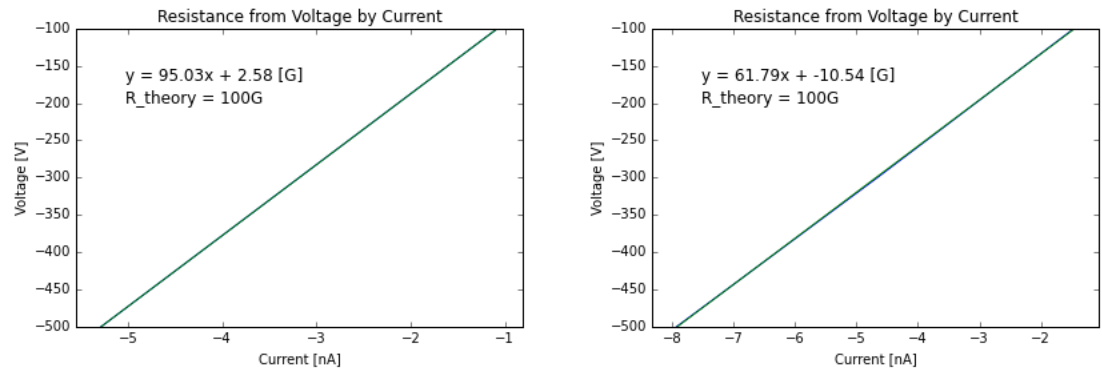
**HVRW42M-1.91T; Resistors 1 & 2**



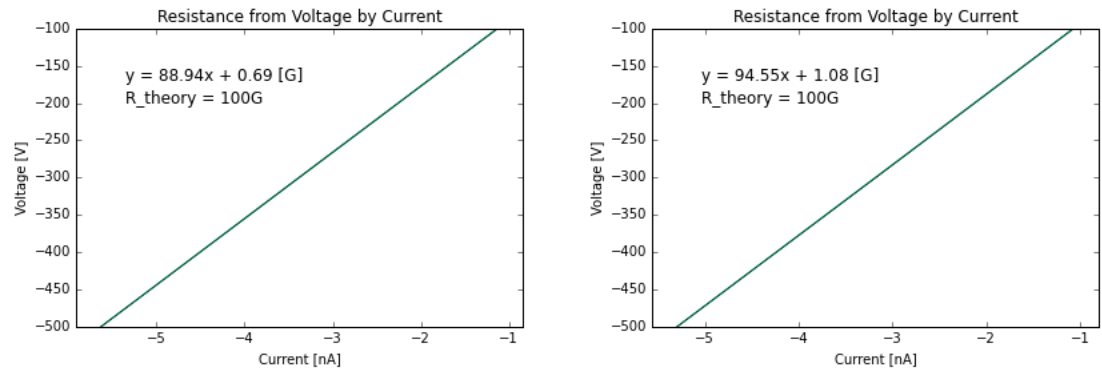
**HVRW43L-100G; Resistors 1 & 2**



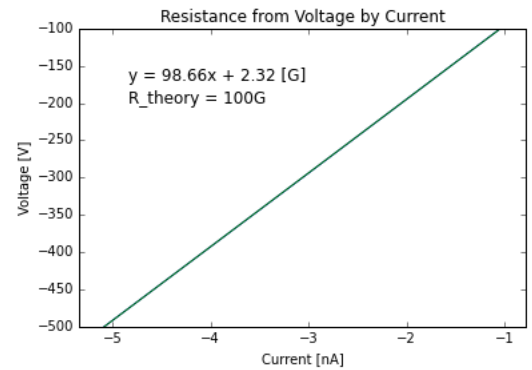
**HVRW39H-100G; Resistors 1 & 2**



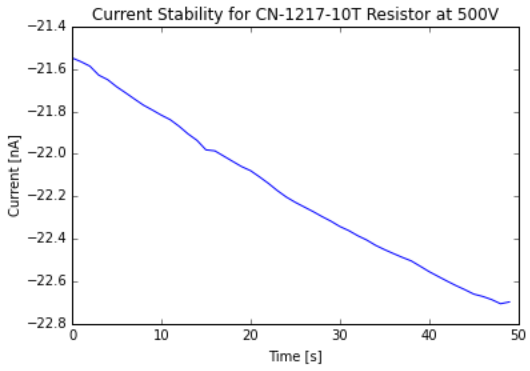
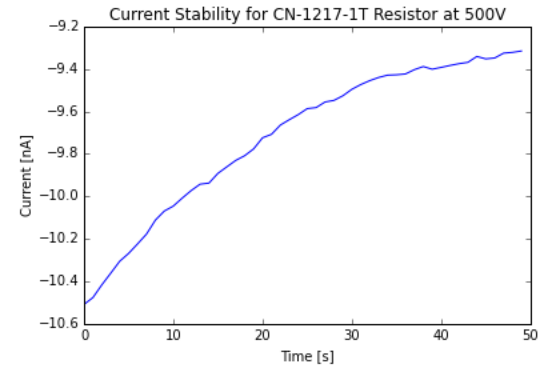
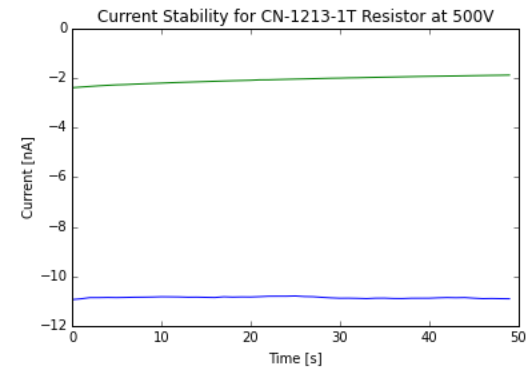
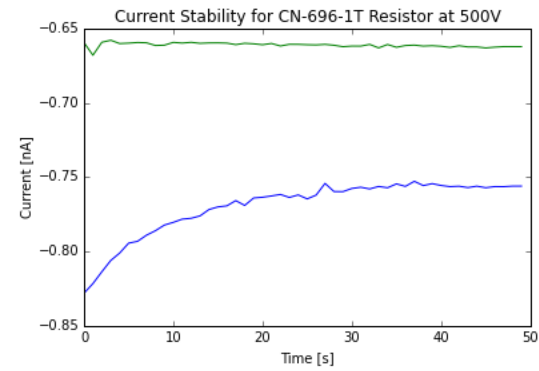
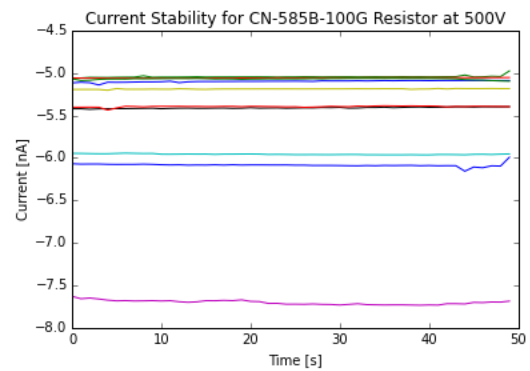
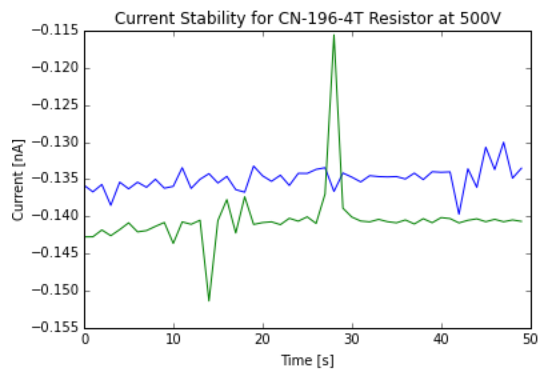
**HVRW39H-100G; Resistors 3 & 4**

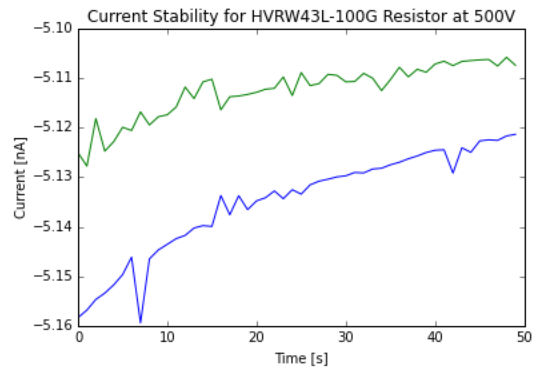
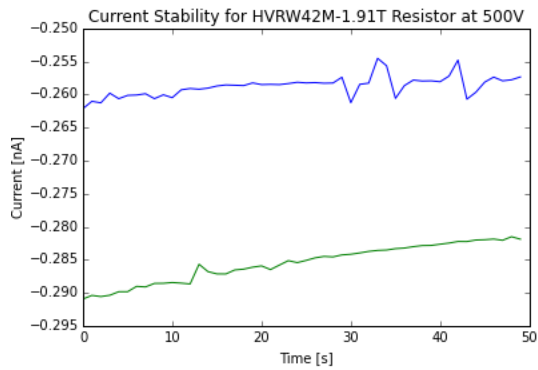
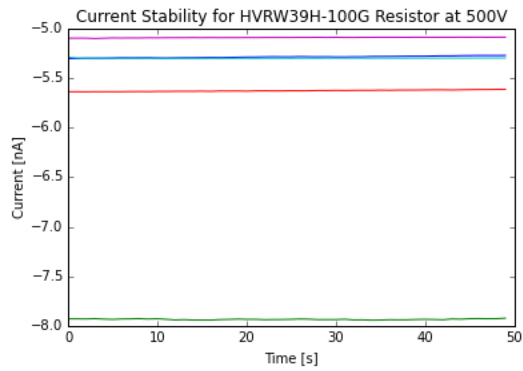
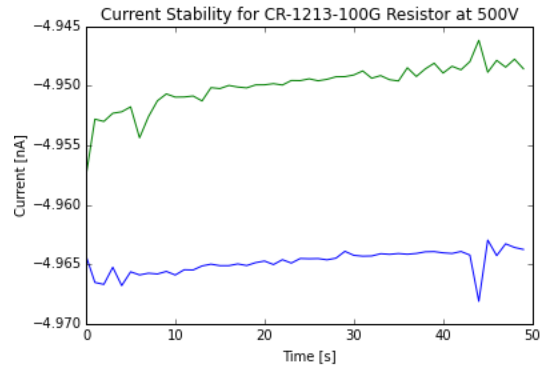
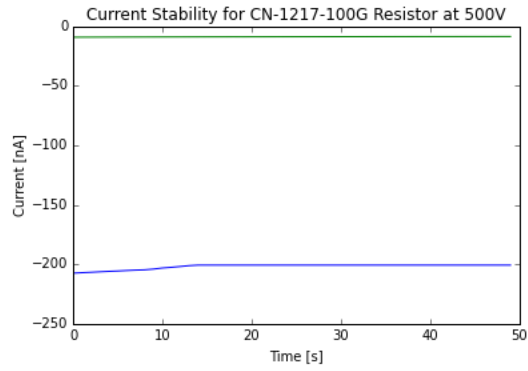


**HVRW39H-100G; Resistor 5**









## Conclusions

This table summarizes the comparison between experimental and theoretical resistances.

<u>Resistor Name</u>	<u>Theoretical R (GΩ)</u>	<u>Experimental R (GΩ)</u>	<u>% Difference</u>
CN-196-4T	4000.00	3669.79	8.3%
CN-196-2-4T	4000.00	3549.02	11.3%
CN-585B-100G	100.00	98.29	1.7%
CN-585B-2-100G	100.00	99.33	0.7%
CN-585B-3-100G	100.00	99.20	0.8%
CN-585B-4-100G	100.00	82.18	17.8%
CN-585B-5-100G	100.00	62.31	37.7%
CN-585B-6-100G	100.00	96.72	3.3%
CN-585B-7-100G	100.00	91.95	8.1%
CN-585B-8-100G	100.00	81.01	19.0%
CN-585B-9-100G	100.00	98.75	1.3%
CN-585B-10-100G	100.00	91.33	8.7%
CN-696-1T	1000.00	620.40	38.0%
CN-696-2-1T	1000.00	751.34	24.9%
CN-1213-1T	1000.00	42.34	95.8%
CN-1213-2-1T	1000.00	249.02	75.1%
CN-1217-1T	1000.00	46.74	95.3%
CN-1217-100G	100.00	2.20	97.8%
CN-1217-2-100G	100.00	57.86	42.1%
CN-1217-10T	10000.00	21.35	99.8%
CR-1213-100G	100.00	101.34	1.3%
CR-1213-2-100G	100.00	101.03	1.0%
HVRW39H-100G	100.00	95.03	5.0%
HVRW39H-2-100G	100.00	61.79	38.2%
HVRW39H-3-100G	100.00	88.94	11.1%
HVRW39H-4-100G	100.00	94.55	5.5%
HVRW39H-5-100G	100.00	98.66	1.3%
HVRW42K-100G	100.00	96.98	3.0%
HVRW42K-2-100G	100.00	97.06	2.9%
HVRW42M-1.91T	1910.00	1933.24	1.2%
HVRW42M-2-1.91T	1910.00	1741.90	8.8%
HVRW43L-100G	100.00	97.64	2.4%
HVRW43L-2-100G	100.00	98.04	2.0%

The experimental values show a wide variety of reliability. Some resistors were consistent with expected resistance values and were stable over time. However, there were some resistors which were inconsistent and highly unstable. Further testing of the resistors would prove useful.

**Shipment Information**

Item #	Part #	Description	Lot #	Date Code	Quantity Shipped
8	HVRW42M1T91J	HVR 42 20kV 1.91T 5.00% TCR:300 RoHs	09919	0903	2
4	HVRW39H1009G	HVR 39 100G 2.00% TCR:50	10689	0947	5
6	HVRW43L1009J4	HVR 43 30.0KV 100G 5.00% TCR:200	14004	1321	2
5	HVRW42K1009J3	HVR 42 20.0KV 100G 5.00% TCR:100	14417	1345	2
1	CN-1217-100G	HVR 56 1000 100G TCR:100 100G ( +0% - 10% )	14511	1349	2
7	CN-1217-1T	HVR 56 1000 1T TCR:100 1T ( +0% -10% )	14512	1403	2
11	CN-1217-10T	HVR 56 1000 10T TCR:500 10T ( +0% -20% ) or best effort	14513	1406	1
3	CR1213V100GG2	CR 1213 10kV 100G 2.00% TCR:1000	14983	1416	2
10	CN-696	HVR 10KV 1T -10.00% TCR:100	15047	1423	2
9	CN-196	UH 1500V 4T 20.00% TCR:350	15407	1440	2
2	CN-585B	HVR 5KV 100G 0.50% TCR:50	15395	1443	10