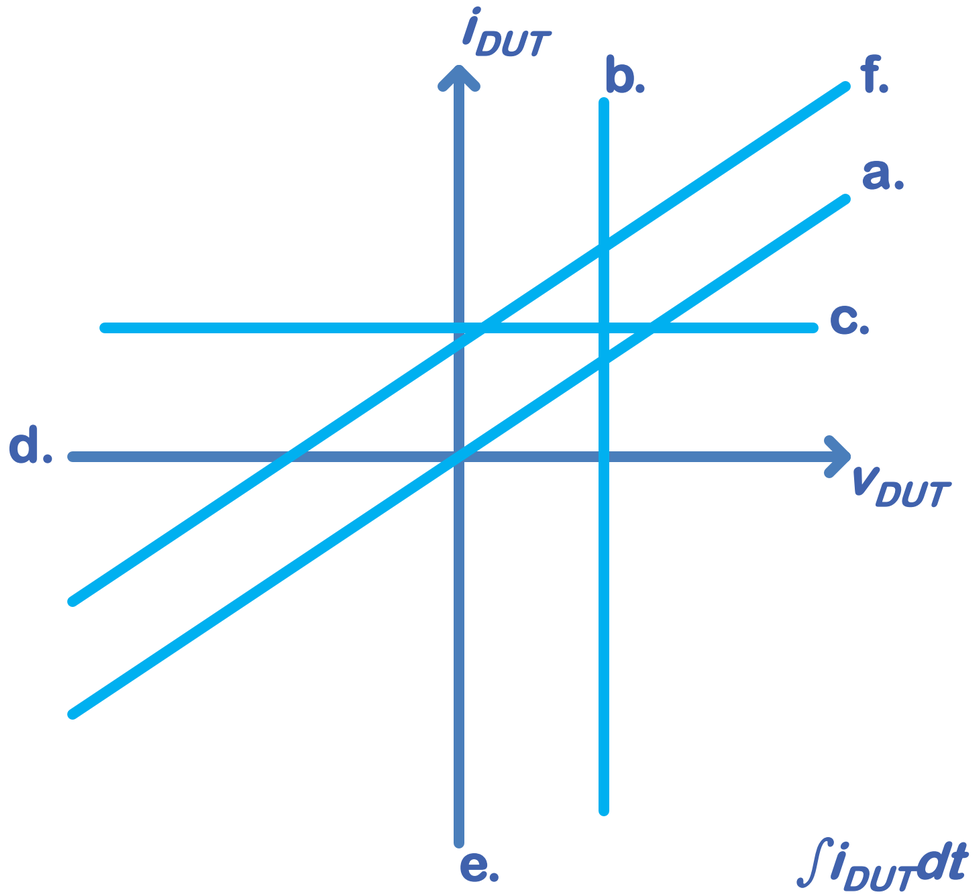
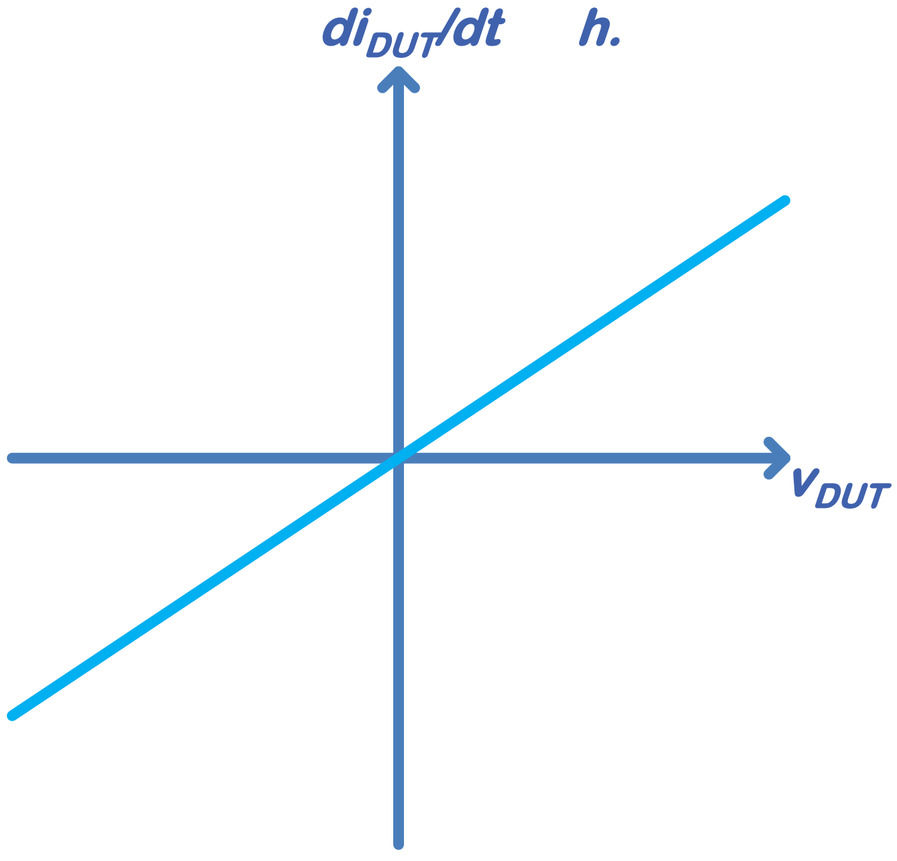
Guess the device from i-v plot



$\int i_{DUT} dt$ g.



a.

b.

c.

d.

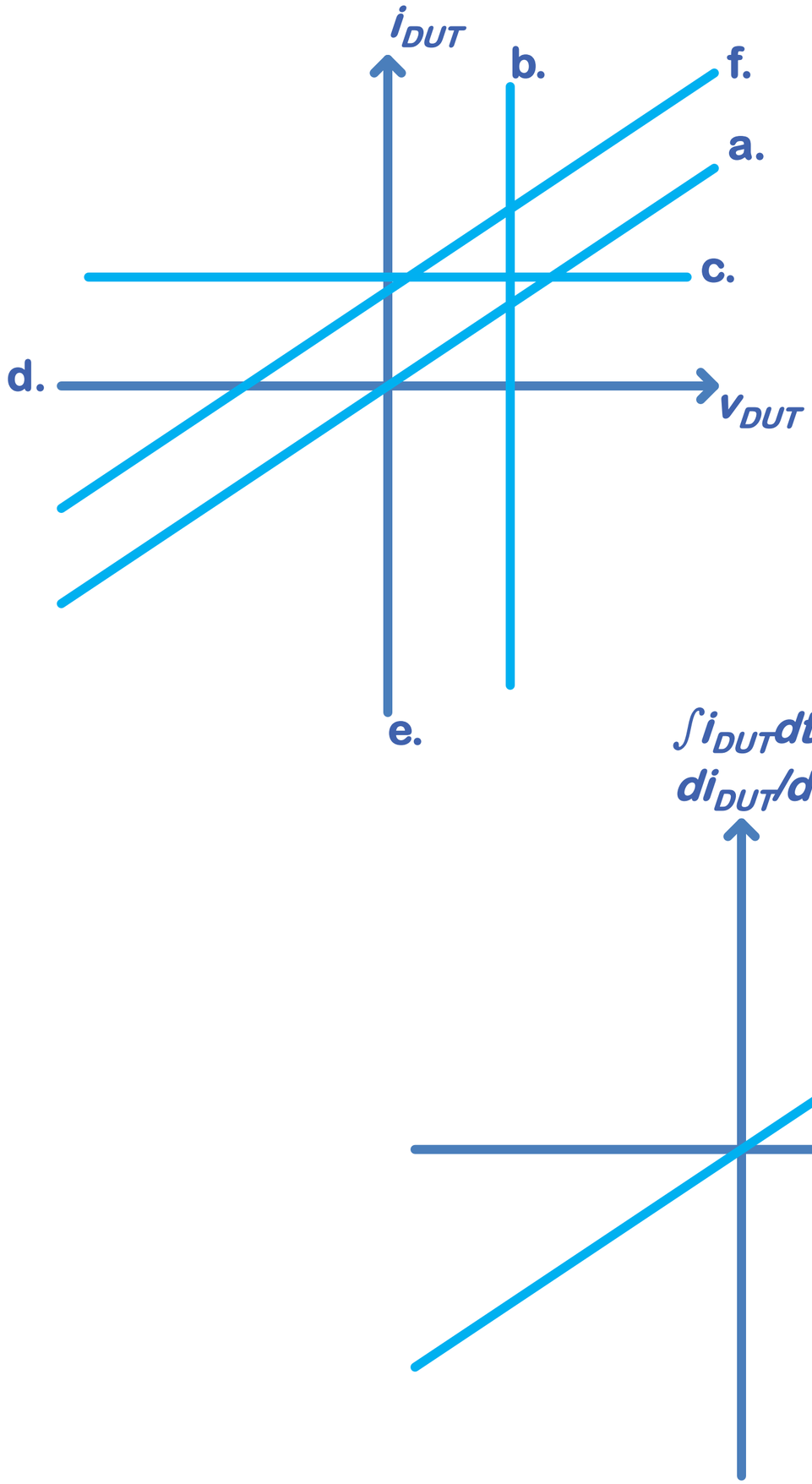
e.

f.

g.

h.

Guess the device from i-v plot



a. resistor

b. voltage source

c. current source

d. open circuit (relates to c and a)

e. short circuit (relates to b and a)

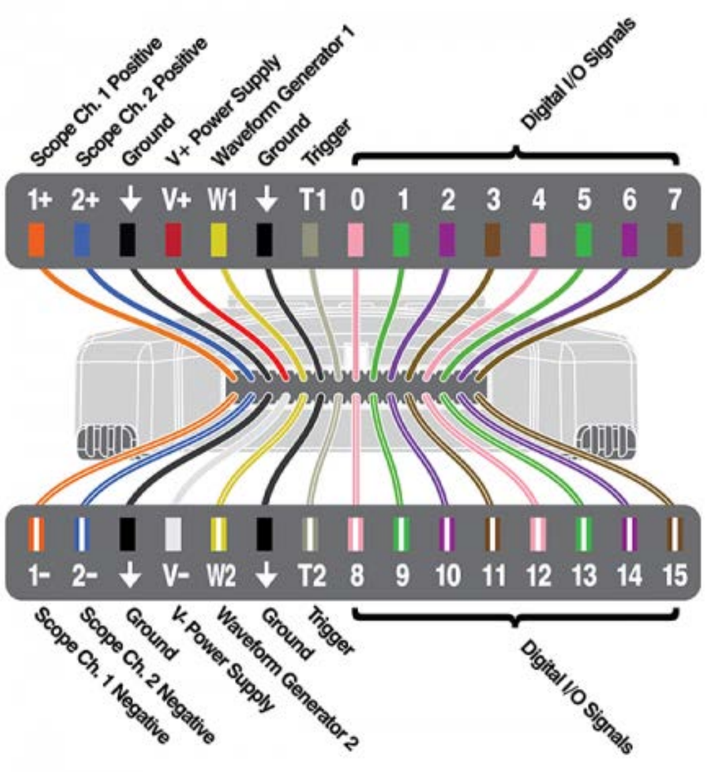
f. voltage source in series w/resistor
current source in parallel w/resistor

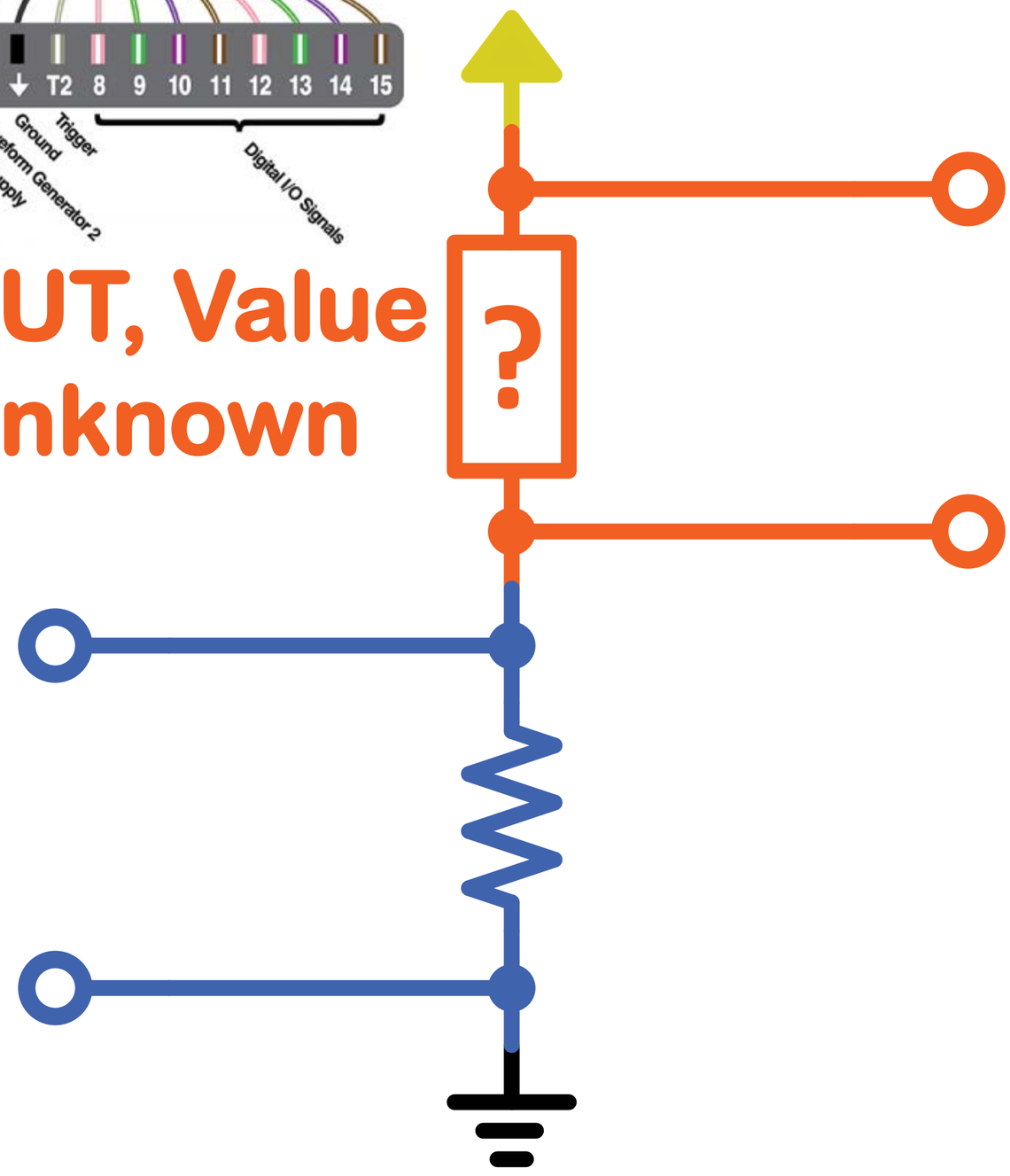
g. capacitor

h. inductor

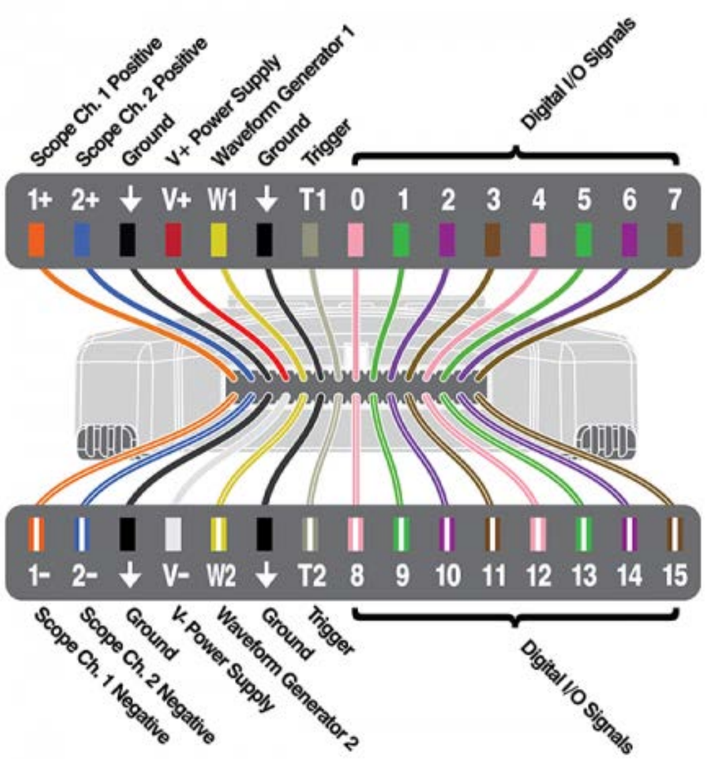
Guess the device from a physical unknown component

Determine the i-v relationship of an unknown device.





Determine the i-v relationship of an unknown device.



Variable Voltage Source, V_{IN}
Sweep Value from -5V to 5V

+

DUT, Value Unknown

?

Measure Device Voltage, V_{DUT}

-

+

Measure V_R
$I_{DUT} = I_R = V_R/100$

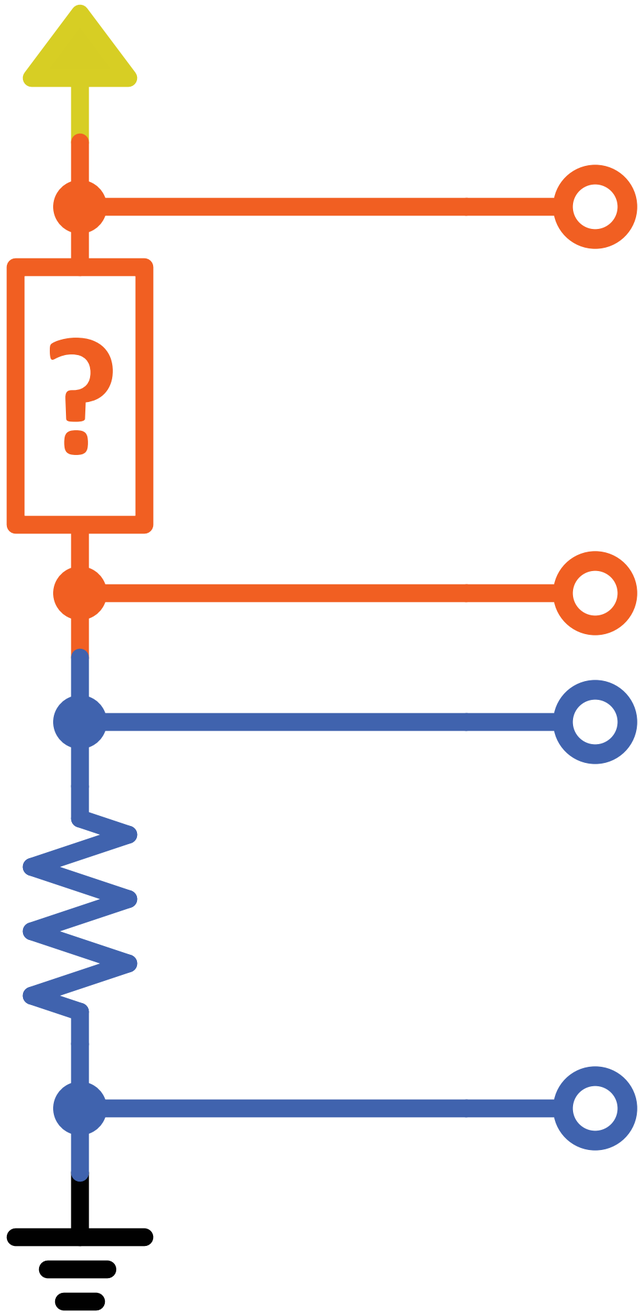
Known Resistance, 100 Ω
(to determine current)

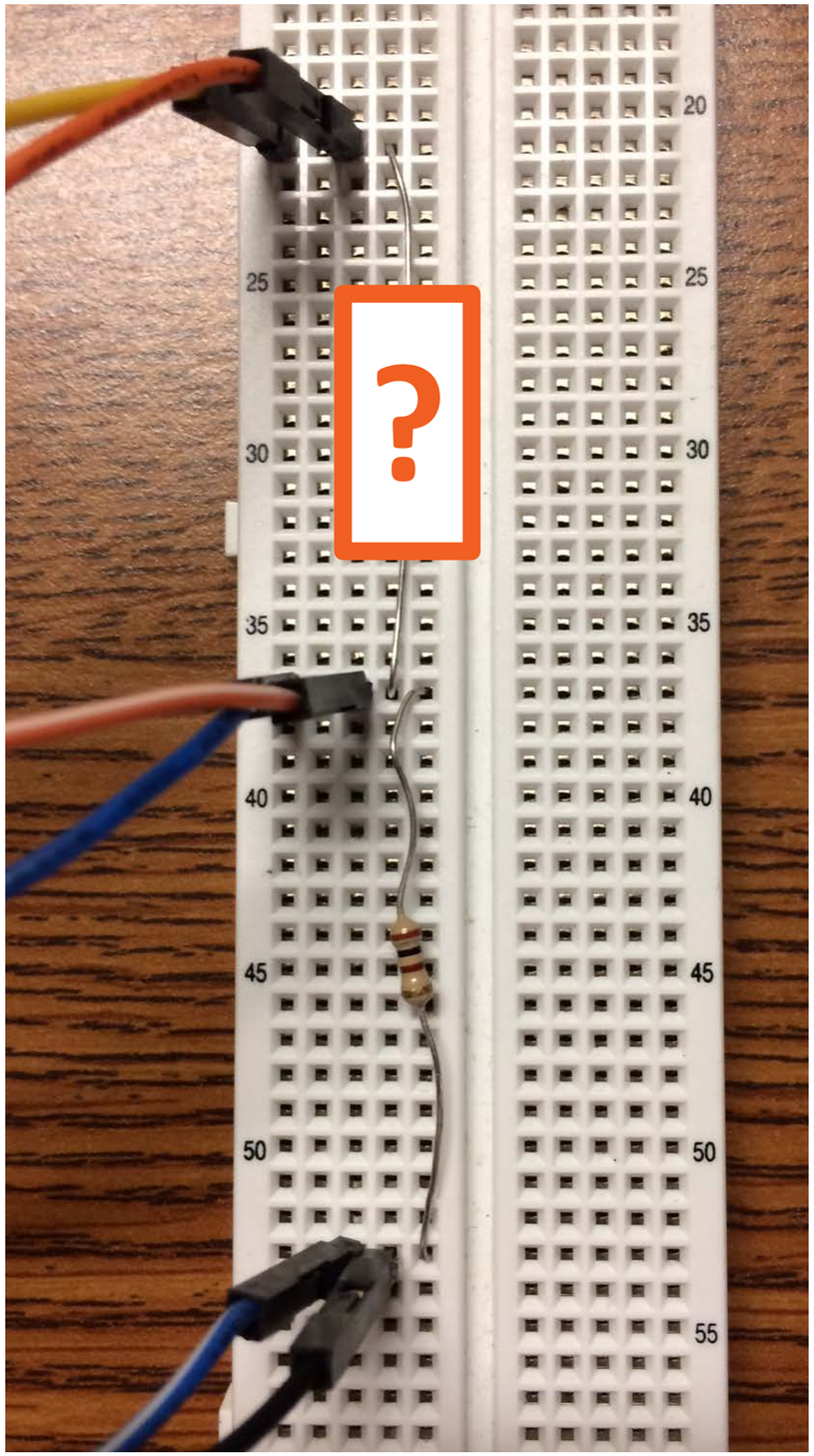
-

Save Results to an Excel File.

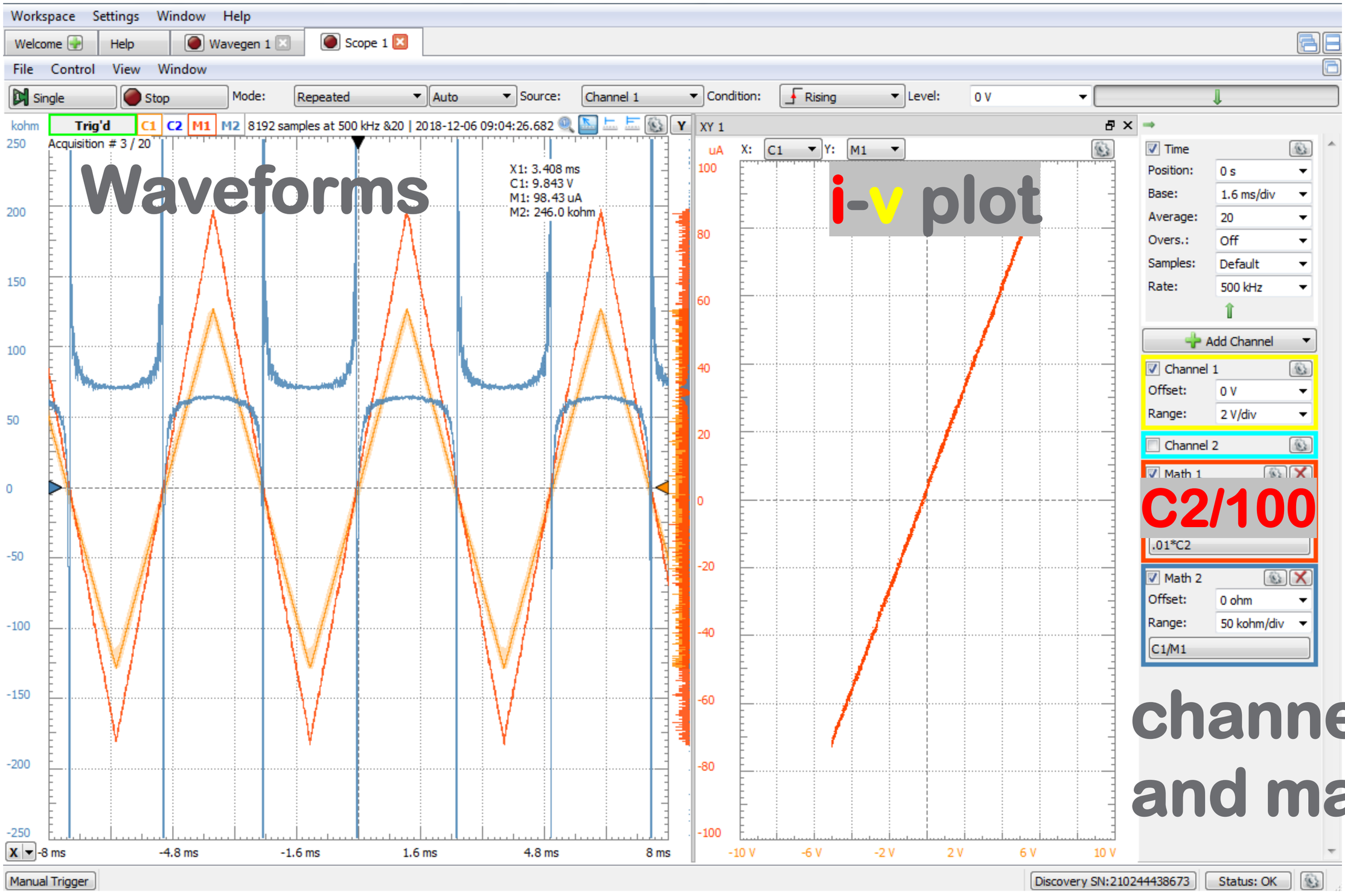
Plot the i-v curve. Determine the DUT value. How does it compare to the actual value?

Example: Set up





Example: $i_R(v_R)$=?



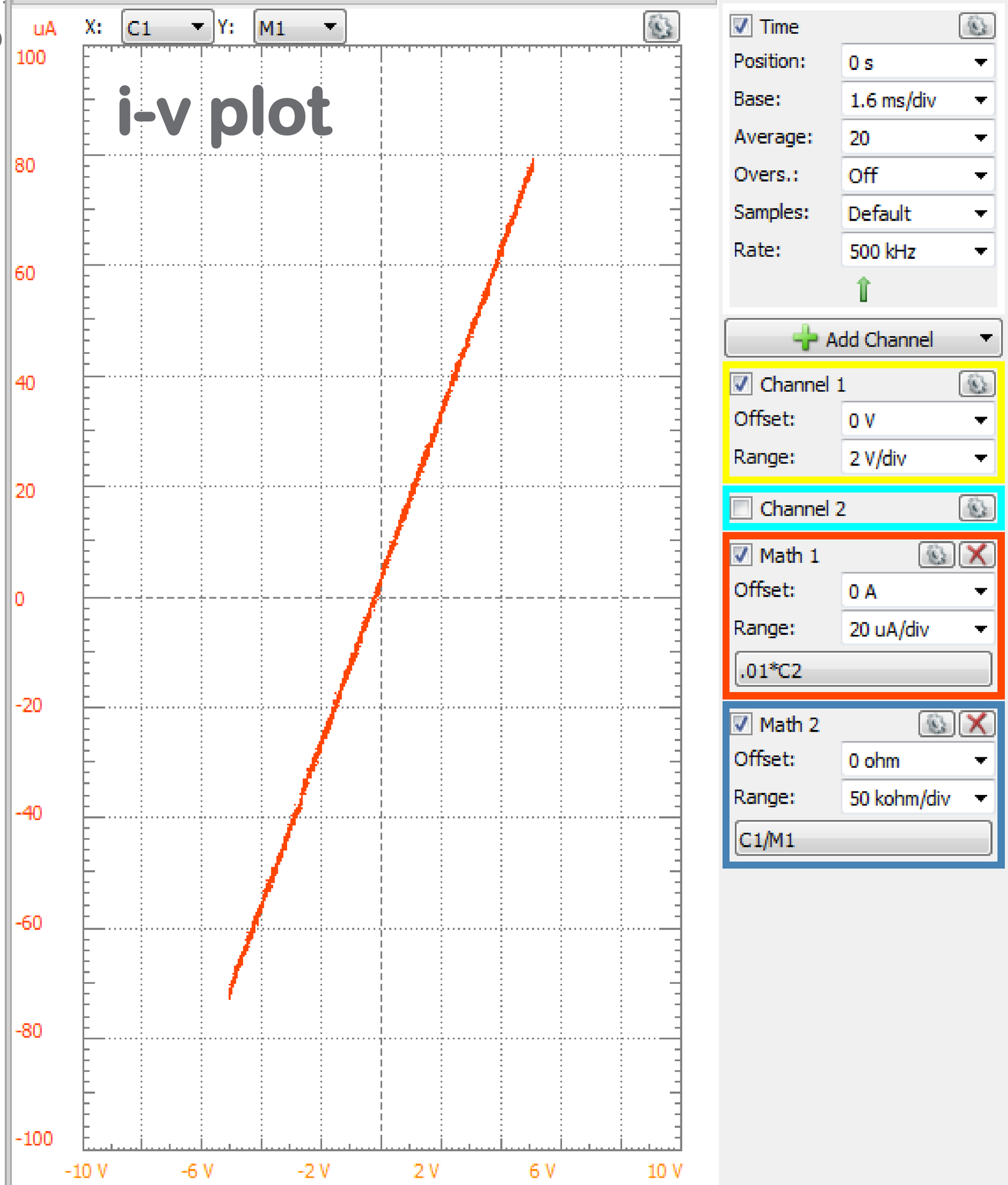
channels and math

What is this?

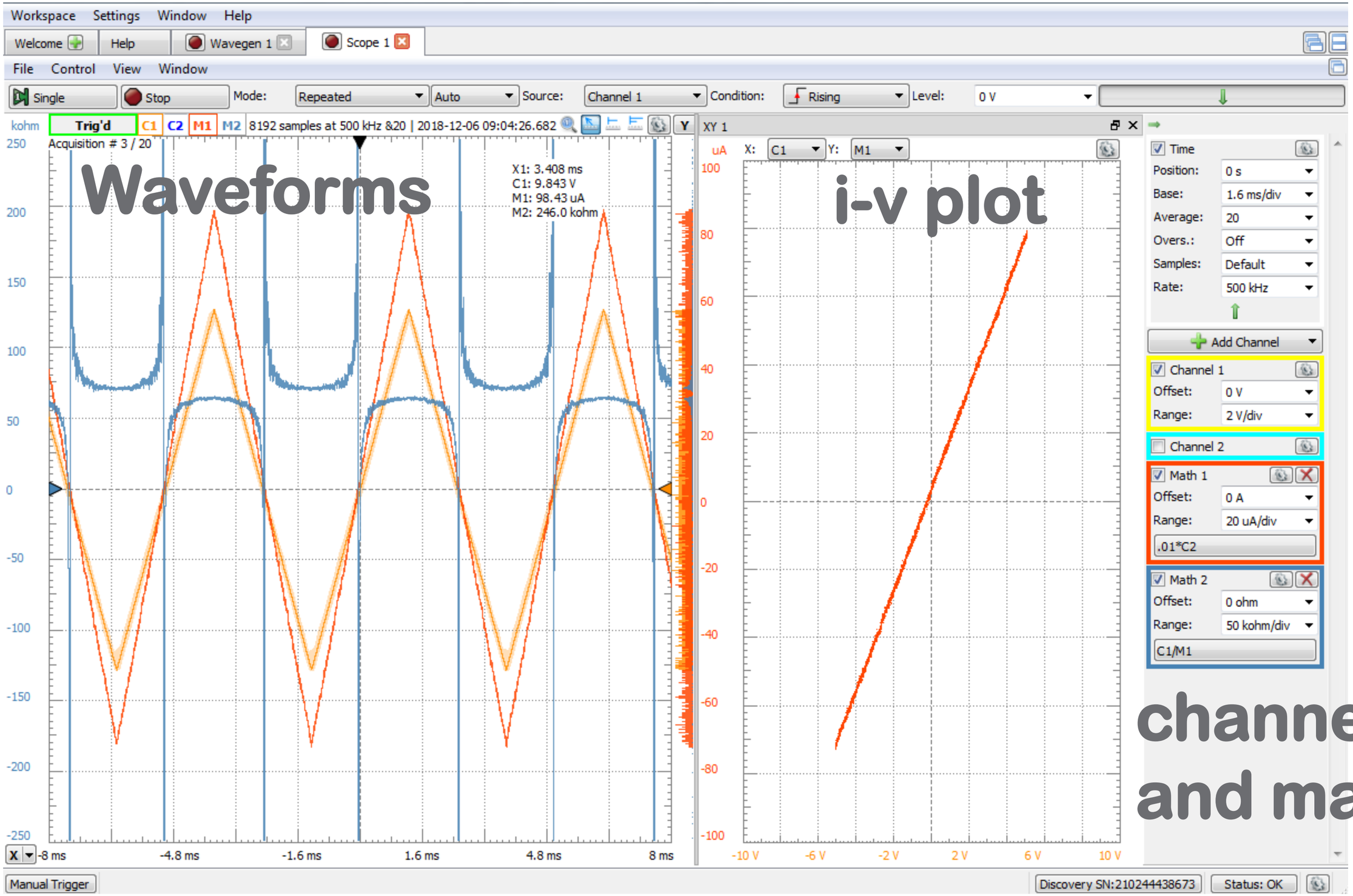
Example: $i_R(v_R)$=?

What is this?

~A straight line through the 0,0.



Resistor Example: $i_R = v_R/R$

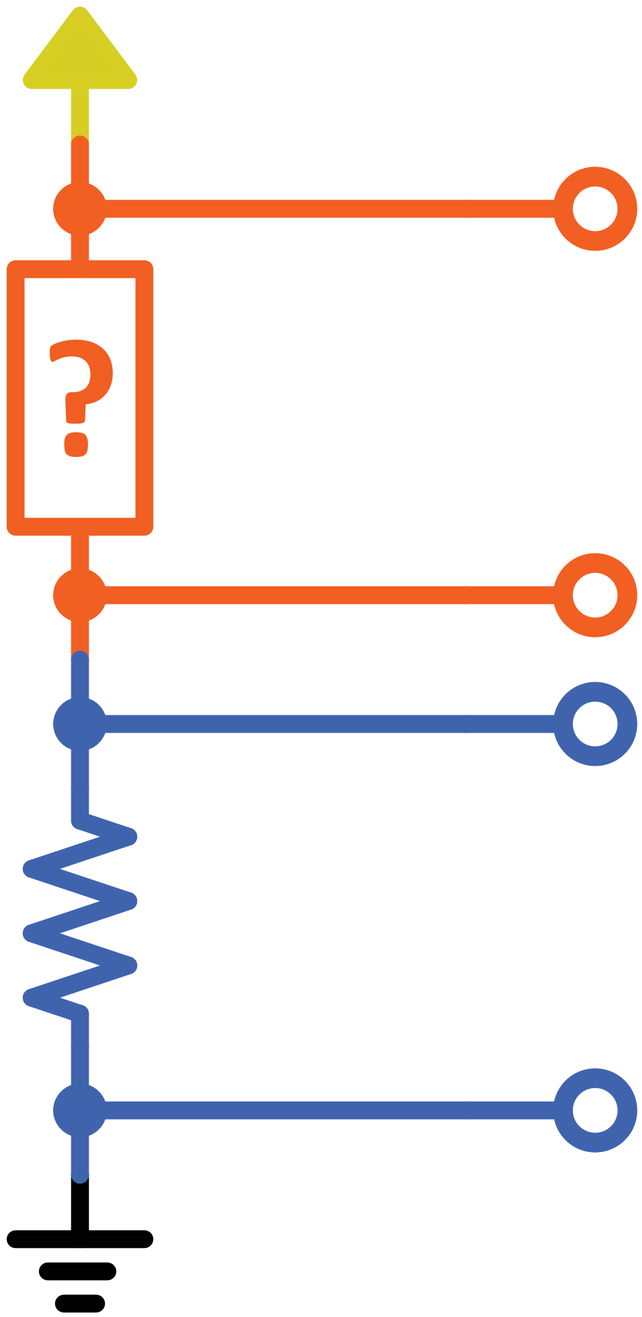


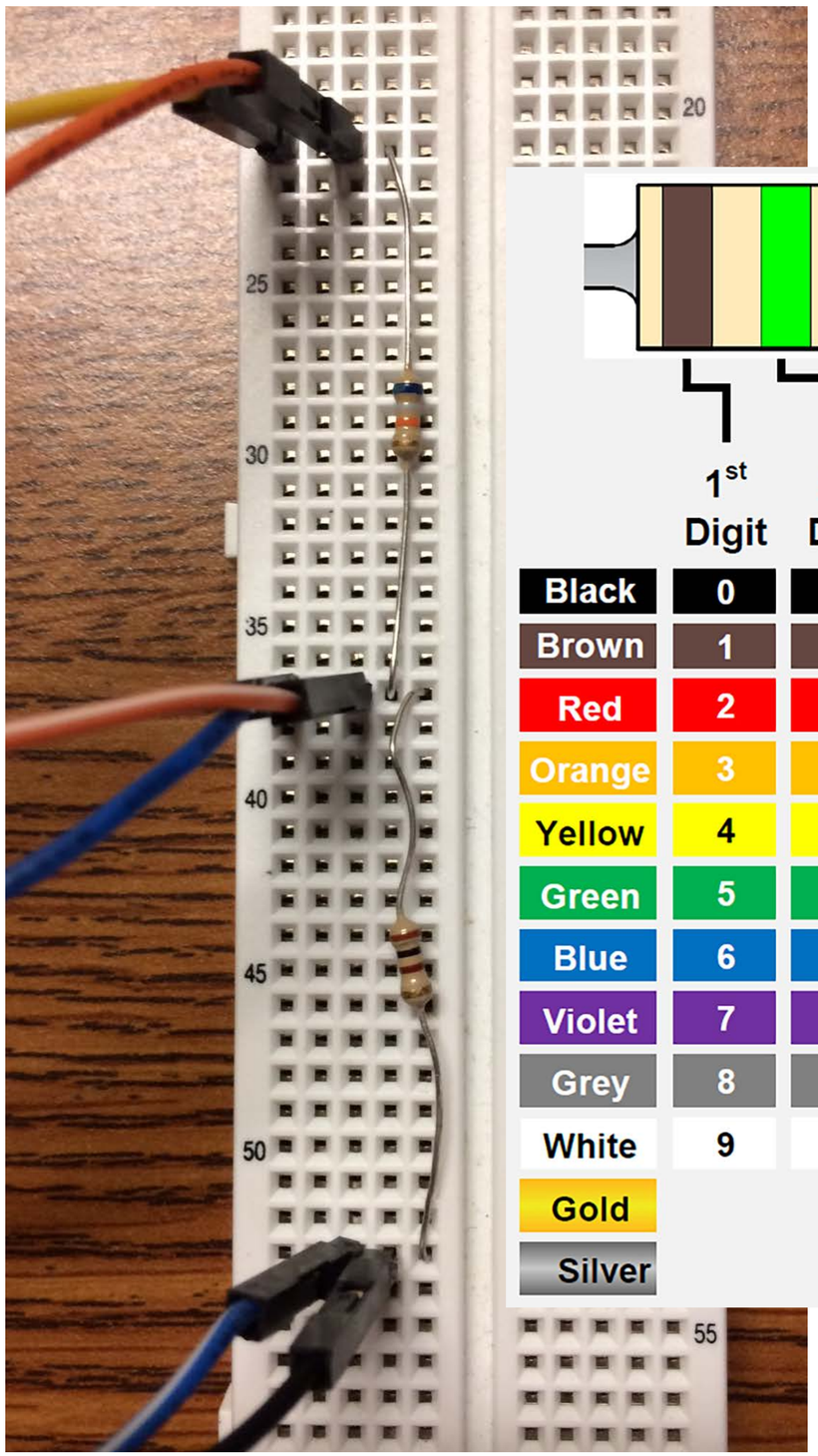
channels and math

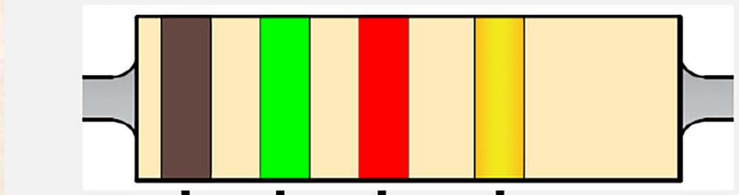
$R = v_R/i_R = 1/(\text{i-v slope}) = 100*(\Delta C1)/(\Delta C2)$

Resistance = 10V/.00015A = 67 kΩ

Resistor Example: Set up







	1st Digit	2nd Digit	Multiplier	Tolerance
Black	0	0	x 1	
Brown	1	1	x10	±1%
Red	2	2	$x10^2$	±2%
Orange	3	3	$x10^3$	±3%
Yellow	4	4	$x10^4$	±4%
Green	5	5	$x10^5$	±0.5%
Blue	6	6	$x10^6$	±0.25%
Violet	7	7	$x10^7$	±0.1%
Grey	8	8	$x10^8$	±0.05%
White	9	9	$x10^9$	
Gold			$x10^{-1}$	±5%
Silver			$x10^{-2}$	±10%

Resistance = 68 kΩ