

Oscilloscope / ScopeCorder

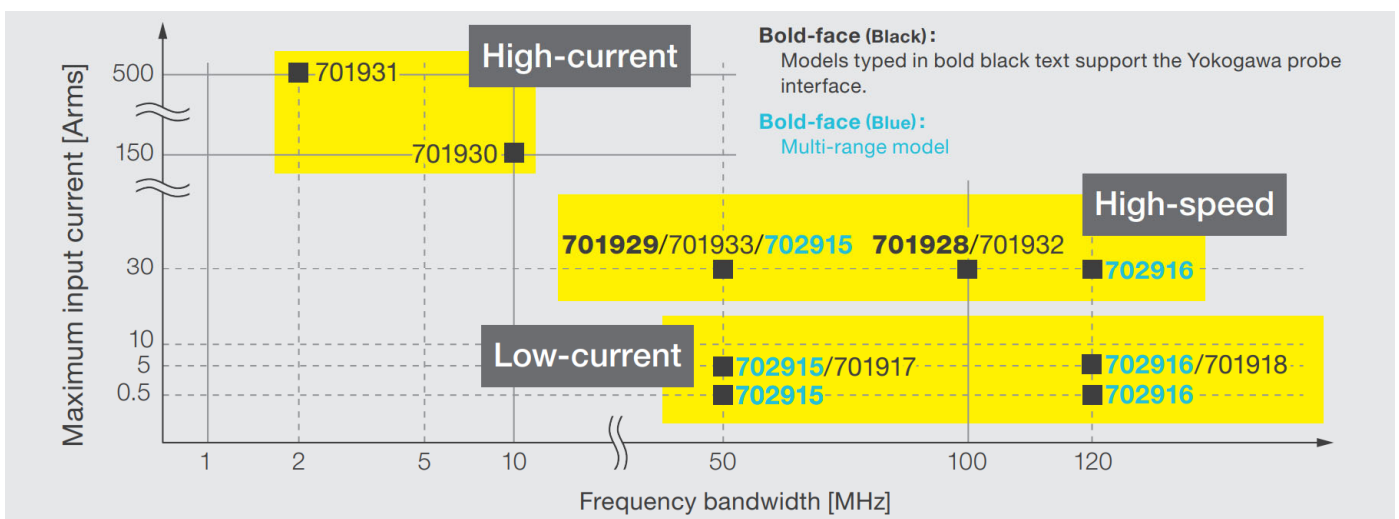
# Supplementary information on current measurements



## Relationship between the measured current of the current probe and the power supply current

There is a limit to the number of probes that can be used at the maximum measured current due to the difference in the current supply capability of the probe power of the measuring instrument.

This document describes how to calculate the number of probes that can be used for the maximum measured current in the probe specifications and the number that can be used when the measured current is low when a measuring instrument and current probe are combined.



### Maximum number of usable current probes for each model

(Note) The maximum usable number shown in the table is for the maximum measured current of each current probe and is a reference value.

#### ● Current Probe

Model	Option	Number of Probe Power	Total power supply current [A]	701933	701932	701931	701930	701929*1	701928*1	701918	701917	Maximum measured current [A] <sup>2</sup>	
				50	50	700	300	50	50	7.5	7.5		
				520	490	580	610	540	500	230	230	Maximum current consumption [mA]	
Oscilloscope	DLM5000HD (4ch model) DLM5000 (4ch model) DLM3000 (4ch model) DLM2000 (4ch model) DLM6000 / SB5000 DL9500 / DL9700	/P4	4	1.2	x 2	x 2	x 2	x 1	x 2	x 2	x 4	x 4	
	DLM3000 (2ch model) DLM2000 (2ch model) DL6000 / DL9000	/P2	2	1.2	x 2	x 2	x 2	x 1	x 2	x 2	x 2	x 2	
	DLM5000HD (8ch model) DLM5000 (8ch model) DLM4000	/P8	8	2	x 3	x 4	x 3	x 3	x 3	x 4	x 8	x 8	
	DL7400	Standard	4	0.5							x 2	x 2	Total sum of 2 terminals is 0.5A or less
	/P4	8	0.25							x 1	x 1		
ScopeCorder	DL950	/P4	4	2.4	x 4	x 4	x 4	x 3			x 4	x 4	
		/P8	8 (1 set of 4 outputs x2)	2.4	x 4	x 4	x 4	x 3			x 4	x 4	4 outputs-1
				2.4	x 4	x 4	x 4	x 3			x 4	x 4	4 outputs-2
	DL850 / DL850V DL850E / DL850EV	/P4	4	1	x 1	x 2	x 1	x 1			x 4	x 4	
	DL750 / DL750P SL1400	/P4	4	0.8	x 1	x 1	x 1	x 1			x 3	x 3	
	SL1000	/P4	4	1.3	x 2	x 2	x 2	x 2			x 4	x 4	
Power Supply	701934 (Probe Power)	---	4	2.5	x 4	x 4	x 4	x 4			x 4	x 4	
	700938 (Probe Power)	---	2	0.6	x 1	x 1	x 1				x 2	x 2	

\*1 : The 701929/701928 is powered from the front panel of the oscilloscope. /Px option is not required. Products with diagonal lines are not supported.

\*2 : Maximum measured current is the maximum peak current for each probe specification.

\*3 : A gray area indicates that the maximum measured current of the probe is not available.

#### ● 3-Range Current Probe

Model	Option	Number of Probe Power	Total power supply current [A]	702915			702916			Range	
				30A Range	5A Range	0.5A Range	30A Range	5A Range	0.5A Range		
				50	7.5	0.75	50	7.5	0.75	Maximum measured current [A] <sup>1</sup>	
Oscilloscope	DLM5000HD (4ch model) DLM5000 (4ch model) DLM3000 (4ch model) DLM2000 (4ch model) DLM6000 / SB5000 DL9500 / DL9700	/P4	4	1.2	x 1	x 4	x 4	x 1	x 4	x 4	
	DLM3000 (2ch model) DLM2000 (2ch model) DL6000 / DL9000	/P2	2	1.2	x 1	x 2	x 2	x 1	x 2	x 2	
	DLM5000HD (8ch model) DLM5000 (8ch model) DLM4000	/P8	8	2.0	x 2	x 8	x 8	x 2	x 8	x 8	
	DL7400	Standard	4	0.5		x 2	x 3		x 2	x 3	Total sum of 2 terminals is 0.5A or less
	/P4	8	0.25		x 1	x 1		x 1	x 1		
ScopeCorder	DL950	/P4	4	2.4	x 2	x 4	x 4	x 2	x 4	x 4	
		/P8	8 (1 set of 4 outputs x2)	2.4	x 2	x 4	x 4	x 2	x 4	x 4	4 outputs-1
				2.4	x 2	x 4	x 4	x 2	x 4	x 4	4 outputs-2
	DL850 / DL850V DL850E / DL850EV	/P4	4	1.0	x 1	x 4	x 4	x 1	x 4	x 4	
	DL750 / DL750P SL1400	/P4	4	0.8		x 3	x 4		x 3	x 4	
SL1000	/P4	4	1.3	x 1	x 4	x 4	x 1	x 4	x 4		
Power Supply	701934 (Probe Power)	---	4	2.5	x 2	x 4	x 4	x 2	x 4	x 4	
	700938 (Probe Power)	---	2	0.6							Not recommended with 3-range current probes.

\*1 : Maximum measured current is the maximum peak current for each probe specification.

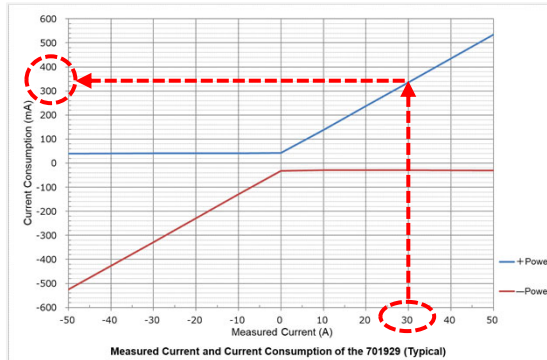
\*2 : A gray area indicates that the maximum measured current of the probe is not available.

## How to calculate the number of usable current probes

The maximum usable number shown in the table on page 2 is for the maximum measured current of each current probe. Therefore, if the current to be measured is low, the number of usable probes may increase.

### Calculation procedure

1. Check the current consumption [mA] from the actual measured current [A] on the graph of the current consumption of the current probe.



Example:  
For the 701929, the current consumption at the measured current of 30 [A] is 340 [mA].

2. Check the total power supply current [A] of the instrument used.

	Model	Option	Number of Probe Power	Total power supply current [A]
Oscilloscope	DLM5000HD (4ch model) DLM5000 (4ch model) DLM3000 (4ch model) DLM2000 (4ch model) DLM6000 / SB5000 DL9500 / DL9700	/P4	4	1.2
	DLM3000 (2ch model) DLM2000 (2ch model) DL6000 / DL9000	/P2	2	1.2
	DLM5000HD (8ch model) DLM5000 (8ch model) DLM4000	/P8	8	2
	DL7400	Standard	4	0.5
		/P4	8	0.25

Example:  
Total power supply current of DLM5000HD (4ch model) /P4 is 1.2 [A]

3. From the total power supply current [A] of the measuring instrument and the current consumption [mA] of step 1 of the current probe, find the maximum usable number by the following formula.

$$\text{Maximum usable number} = \frac{\text{Total instrument power current [A]}}{\text{Current consumption of the current probe [mA]}}$$

In the above example, the current to be measured is 30 A, the current consumption is 340 mA, and the total power supply current of the DLM5000HD (4ch model) is 1.2 A.

$$\begin{aligned} \text{Maximum usable number} &= 1.2 \text{ [A]} / 340 \text{ [mA]} \\ &= 3.52... \\ &\approx 3 \text{ (Truncate after decimal point)} \end{aligned}$$

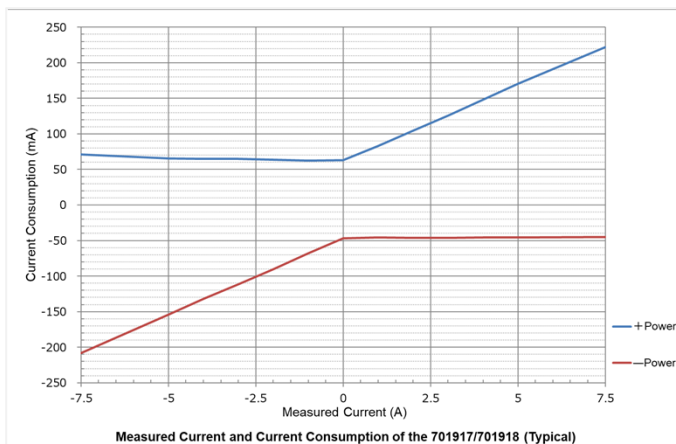
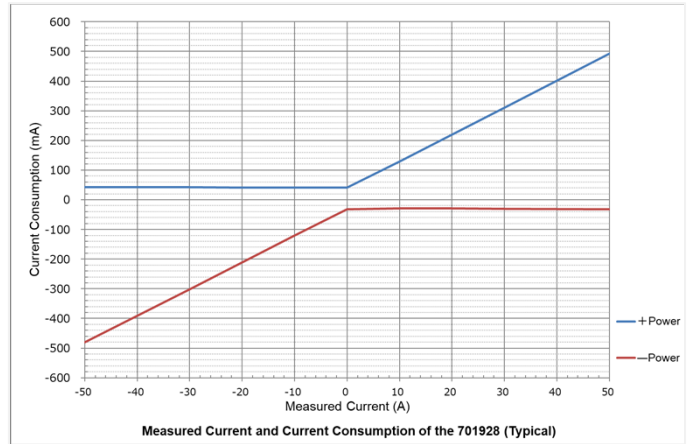
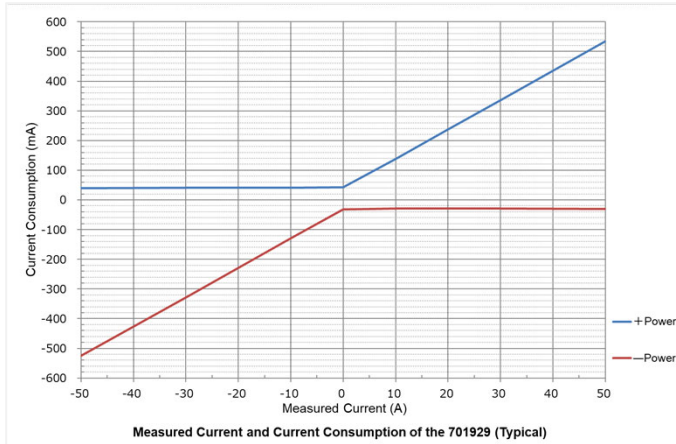
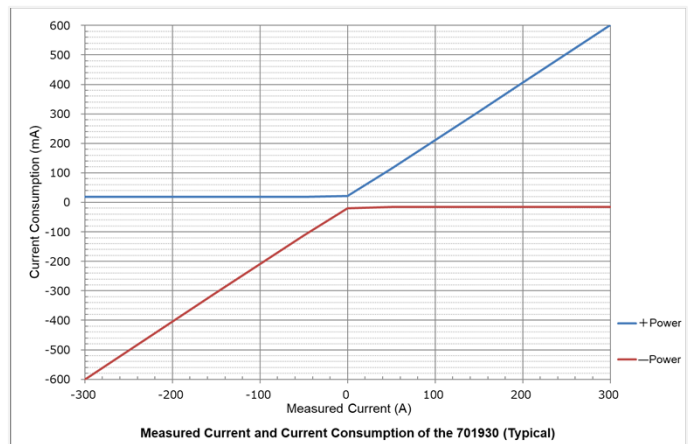
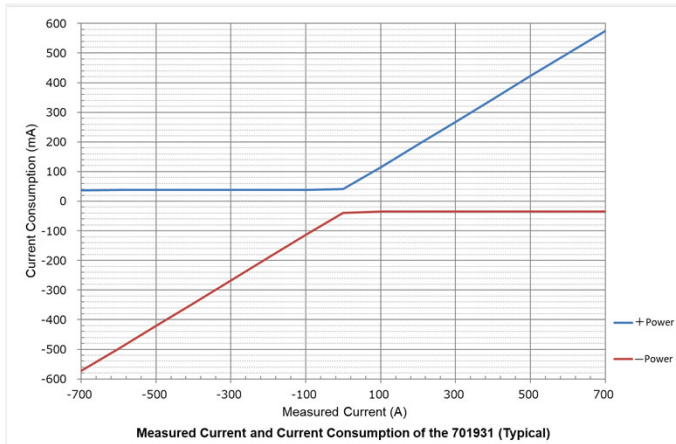
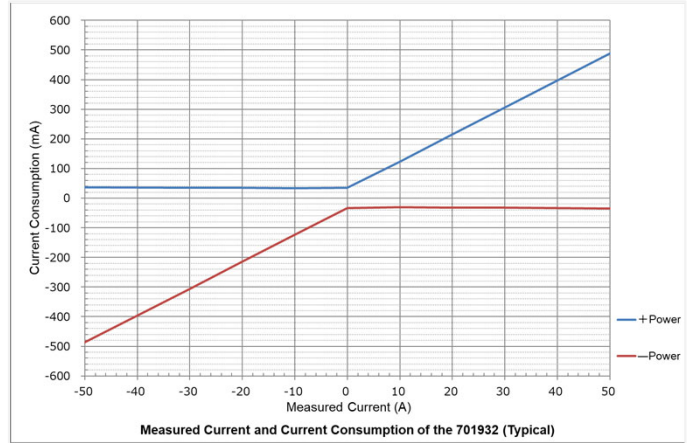
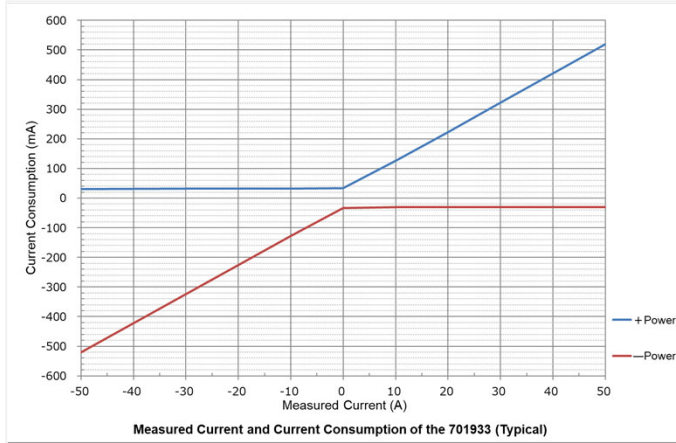
Thus, the number of usable wires at the maximum current consumption of 50 A was 2, but at 30 A it becomes 3.

Supplement: From the formula in 3, the current to be measured when using 4 wires with the DLM5000HD (4ch model) is

$$\begin{aligned} \text{Current consumption of the current probe} &= 1.2 \text{ [A]} / 4 \text{ [probes]} \\ &= 300 \text{ [mA]} \end{aligned}$$

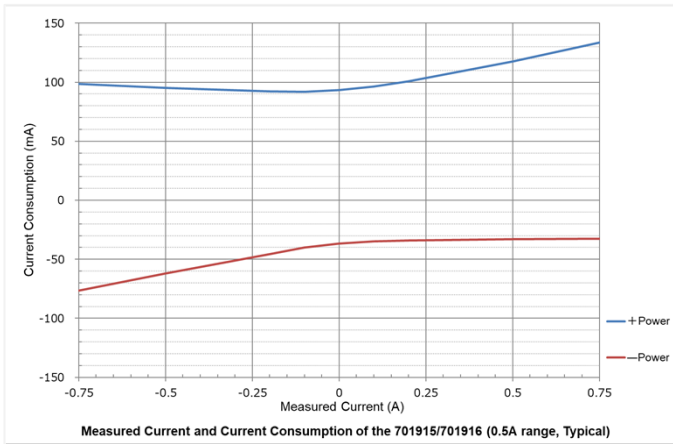
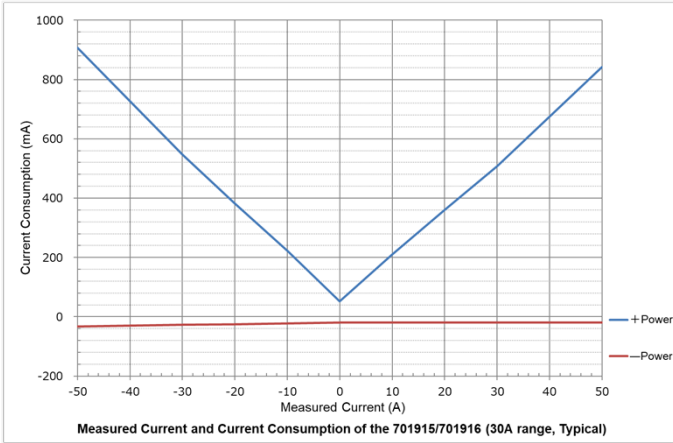
From the current consumption graph, the measurable measured current is 26 [A].

### Measured current and current consumption of current probe (typical value)



<p><b>701932</b> DC to 100MHz, 30A  <b>701933</b> DC to 50MHz, 30A</p> 	<p><b>701930</b> DC to 10MHz, 150A  <b>701931</b> DC to 2MHz, 500A</p> 
<p><b>701928</b>(PCB100) DC to 100MHz, 30A  <b>701929</b>(PCB050) DC to 50MHz, 30A</p> 	<p><b>701917</b> DC to 50MHz, 5A  <b>701918</b> DC to 120MHz, 5A</p> 

### Measured current and current consumption of current probe (typical value)

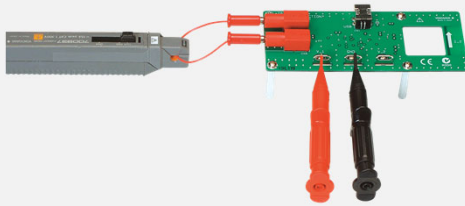


**701915** DC to 50MHz, 30A / 5A / 0.5A  
**701916** DC to 120MHz, 30A / 5A / 0.5A



### Accessories for Current Probes

**701936** Deskew correction signal source



To enable the skew between voltage and current inputs to be adjusted

**701934** Probe Power Supply

- A power supply for current probes, FET probes, and differential probes.
- Provides power for up to four probes, including large current probes.



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