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forum Instrumentation Reference device Test the high-level voltage divider Datron 4902S

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Test the high-level voltage divider Datron 4902S [copy Link]



lymex

Published on 2011-2-13 07:49:19 | Just look at the author

Original poster Direct elevator



sequence

What is 4902S? It is a high-level voltage divider, see: <http://bbs.38hot.net/read.php?tid=137>
 For more photos of 4902S, see here: <http://bbs.38hot.net/read.php?tid=5159>

How to test 4902S? This is very nerve-racking. The possible methods are as follows:

1. The voltage divider is used for voltage division, so it should be connected to the rated partial pressure state, and then see its partial pressure accuracy and change. However, this test requires too high a voltage source and test meter, because the index of 4902S is much higher than the common voltage source and test meter.

2. Use a standard voltage divider and the tested voltage divider to divide the voltage together. Then compare the partial pressure values. This is a commonly used method, but it is not realistic to use it here, because one cannot find a better voltage divider than 4902S, and even if there is another 4902S, it is impossible to say who is better. Even with the 752A, it can only compare 10:1 and 100:1, not many other voltages.

3. Directly test the voltage divider resistance. The 4902S is actually divided into two parts. T 100V. It consists of 10 10k series connected in series. Each 10V constitutes a partial voltage. If you directly test these 10 10k, you can indirectly To understand its partial pressure status resistors, plus the first part of 100k, a total of 1M, to form a partial voltage of 0V, 100V, 200V. These 10 100k can be tested directly.

4. Derating partial pressure. That is, for 100V, only add to 60V, and then test 10 partial volt connected in series with 6 highly stable 10V references, and the index is much better than t

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In fact, the test method is the above 3 and 4.

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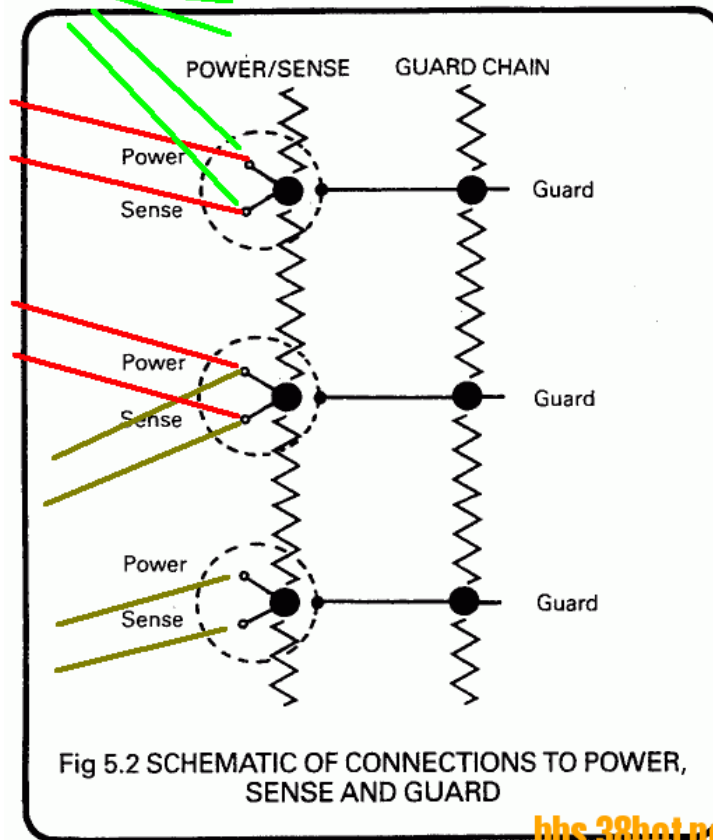
Landlord | Posted 07:49:23 13 Feb 2011 Google | This Author

sofa



100V voltage dividing resistors results

connection, the group 10 is a scanning line switch 4, respectively connected to the resistor divider 10, both ends of each resistor are flag Power and Sense, in fact symmetrical, or Without distinction:



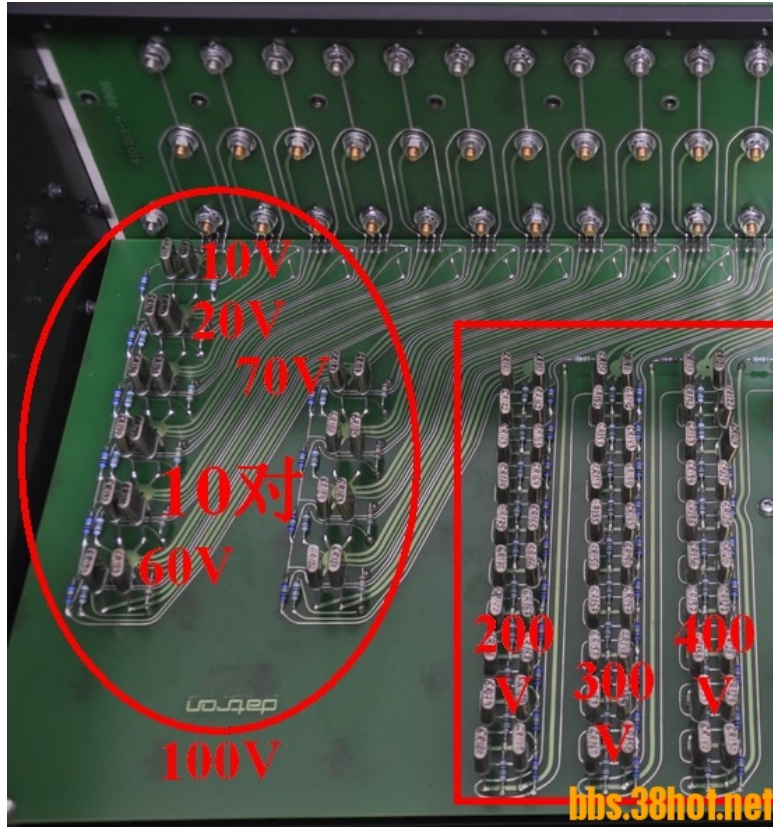
In the above picture, the brown line can be considered as the first group, the red line is the line is the third group. It can be seen that there is a cross between groups, which is no way connected end to end. In fact, there is no problem with the cross wiring, because the test leads are disconnected.

internal

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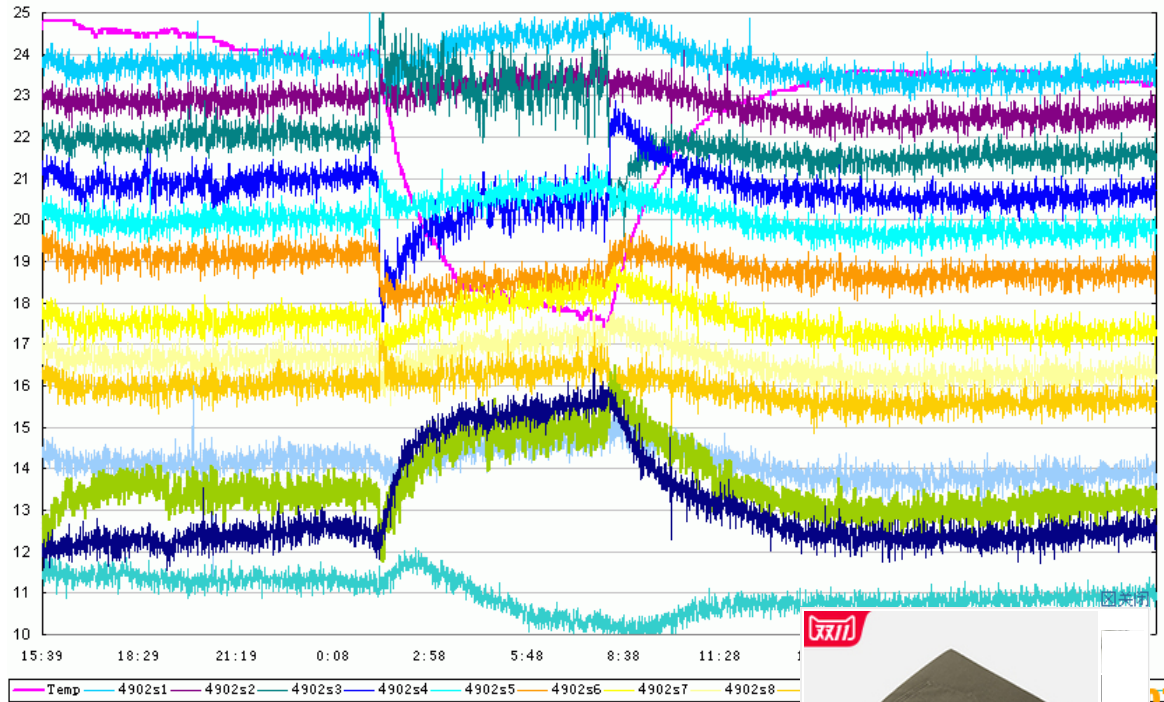
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The test uses the natural temperature change method, that is, open the window at night to let the temperature drop, so that the performance of 4902S under temperature changes can be seen.

4902S, 0-100V分压电阻测试, 3458A 10k档与SR104对比, 2011-2-2开始测试



The first pink line is the temperature. After the window was opened, the temperature gradually drops.

The next 10 wires are 10 10V-10k divider resistors of 4902S, s1 is 10V, s2 is 20V, and so on. The temperature coefficients of these 10 resistors are positive or negative, and the maximum temperature coefficient is around 0.2pm/K. Not too big.

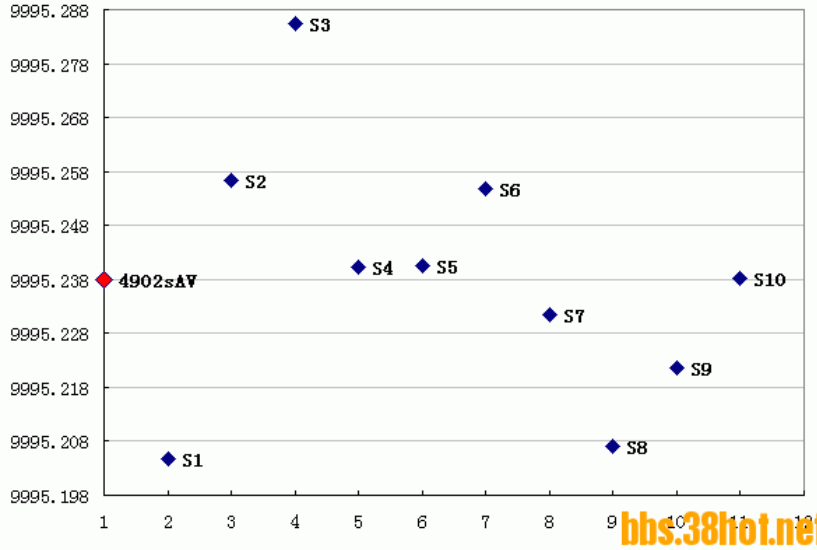
However, S3 has a larger recoil phenomenon.

On the other hand, the resistance values of these 10 resistors have been translated in the a

is to arrange them in order.

However, the actual resistance is much smaller than 10k, and there is a certain degree of dispersion:

4902S 100V电阻离散性, 每格1ppm



It can be seen that the maximum dispersion is nearly 4 ppm. It stands to reason that for a resistance of 0.005% (that is, 50 ppm), a deviation of a few ppm is not a big deal, and the resistance of this part is not adjustable. There are only two points that I don't understand:

1. 20k and 20k and "15M+*+2M adjustable", why adjust the average value to 9995.24?
2. Why doesn't Datron customize a resistor larger than 10k? For example, 10005 ohms, so that it can be closer to 10k instead of the current 9k995.

In fact, these two problems are the same. The reason is that the resistance of 10005 was not set at that time, or Datron thought it was irrelevant. In fact, this resistance value has deviated from 10k by close to 500ppm, which is very large. Only when the deviation is less than 100 ppm, can the quadratic term be ignored in the simplified calculation. In the index of 4902S, the input impedance is also given as 1k/V, but the deviation is not given.

OTHER SPECIFICATIONS

Input Resistance	Power/Sense Chain: 1kOhm/Volt;
Maximum Input Voltage	20% overrange on any voltage tap.

Other comparisons:

mytek-10k has a temperature coefficient of -0.3ppm/K, with backlash and high noise; the commercial SRX-10k -0.52ppm/K, which is not small, but other performance is normal; 4214-h is hot and cold In the box (but not opened), there is a large temperature hysteresis, which is calculated as +0.13ppm/K after being excluded, which is very good

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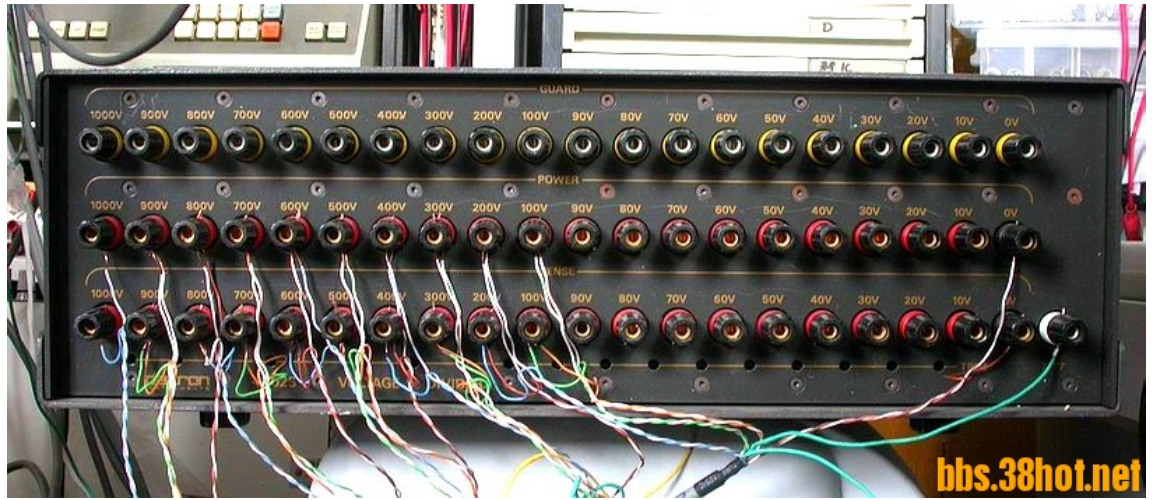


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The 1000V divider resistance test result is

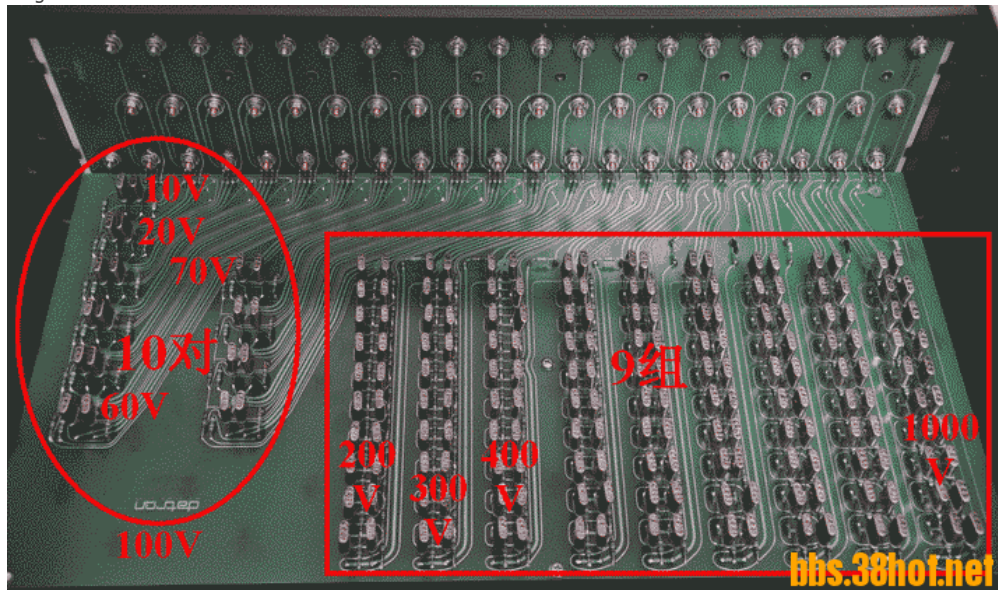
similar. At this time, the 10 4-wires of the scan switch are connected to 1000V to 100V, and

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Of course, the 100k gear of 3458A is used at this time, and the contrast resistance is still SR104.

From the internal photos, it is actually testing 10 groups of resistors, each group is 100k, and each group is composed of 20 gold seals.

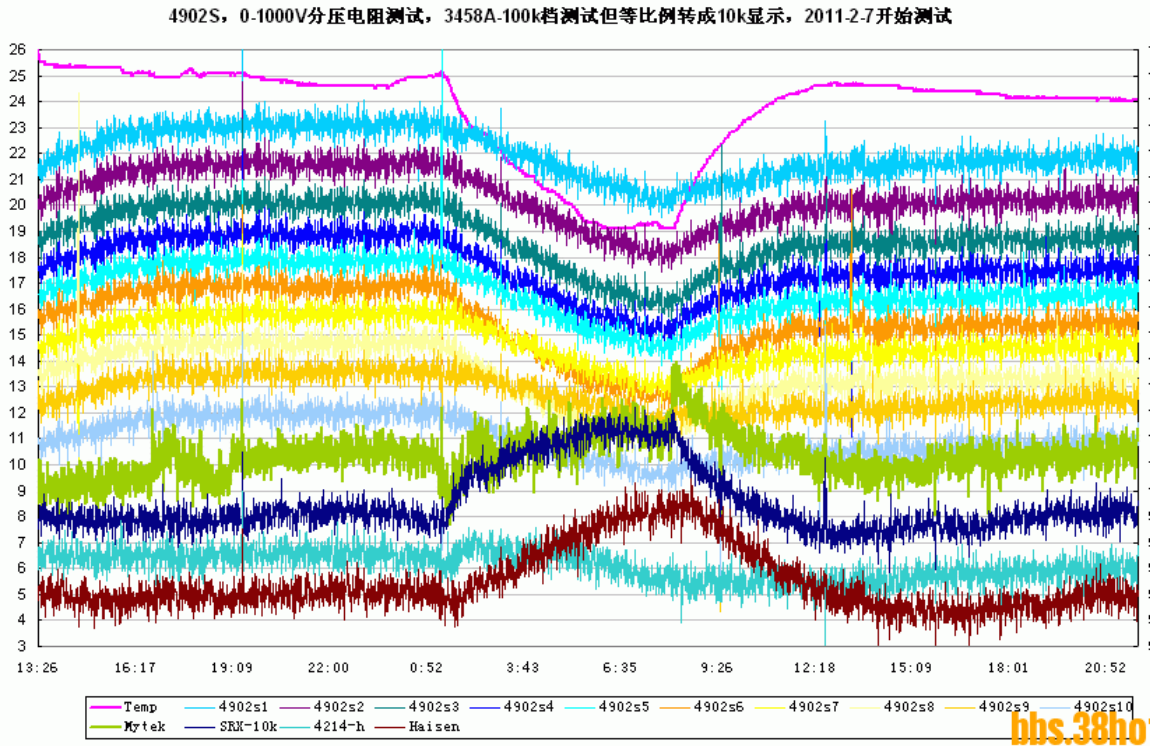


The test uses the natural temperature change method, that is, open the window at night to let the temperature drop, so that the performance of 4902S under temperature changes can be seen.

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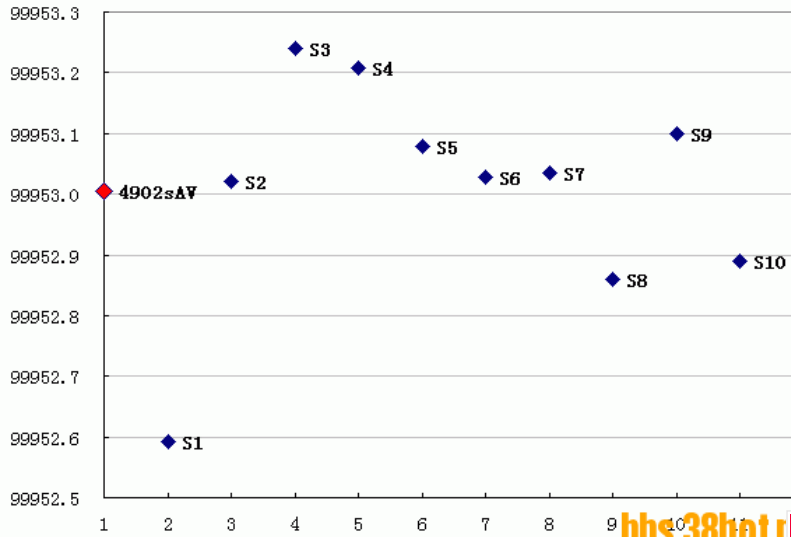
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The first thin pink line is the temperature. After the window was opened, the temperature gradually dropped by more than 5 degrees.

The next 10 wires are 10 10V-10k divider resistors of 4902S, s1 is 10V, s2 is 20V, and so on. It can be seen that these 10 resistors are also getting smaller, that is, they all have a positive temperature coefficient, but the magnitude of the decrease varies from 2 ppm to 4 ppm. Therefore, the temperature coefficient of these 10 resistors can be calculated. It is between 0.4ppm/K and 0.8ppm/K.

From the following 1000V discrete distribution, there is still 4ppm, but since each group of resistors are adjustable, how can this be explained?

4902S 1000V电阻离散性, 每格1ppm



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100V partial pressure test result

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Concluding remarks

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Sofa, wait and see

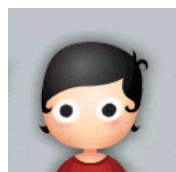
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Top it, grab a sofa!

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Study on the floor.

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Protest, I looked at Tie Mingming after I returned, it was from the sofa!

Advertisement for a sofa. The image shows a dark-colored sofa with a red '双喜' (Shuangxi) logo. Below the image, the price is listed as **¥293.00** (crossed out) and ~~¥293.00~~. A small red heart icon is visible at the bottom left of the ad.

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