

Type 1776 Precision Decade Resistor Voltage Dividers

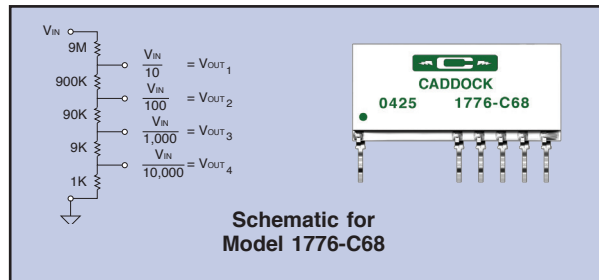
Input Voltage Dividers for Digital Multimeters and Range-Switching Instruments Introducing New Smaller Models at Lower Cost

The exceptional performance of this extensive family of Type 1776 Precision Decade Resistor Voltage Dividers has been achieved through the special combination of advantages provided by Caddock's Tetrinox® resistance films. This advanced film resistor technology provides the performance characteristics required by the precision input signal circuits of both bench-type and laboratory digital instruments.

In addition to requiring less board space, these compact precision resistor networks deliver higher performance than selected discrete resistor sets and thin-film networks.

There are now 39 standard models in the expanded family of Type 1776 precision resistor networks that include:

- 3, 4, and 5 - decade voltage dividers with ratios from 10:1 to 10,000:1.
- 1,200 volts continuous ratings and overvoltage to 2,000 volts.
- Many combinations of Ratio and Absolute Tolerance, and Ratio and Absolute Temperature Coefficient.



For complete information on quantity price and delivery, contact our Sales Office.

| Model No. | Resistance Values | | | | | Fig. | Voltage Rating (7) | Absolute Tolerance % | Ratio Tolerance % (1) | Abs. TC ppm/°C | Ratio TC ppm/°C (2) | TC Temp. Range (2) | Voltage Coef. of Ratio ppm/volt (3) | Ratio Stability % Change in Ratio | | |
|------------|-------------------|---------|---------|--------|---------|------|--------------------|----------------------|-----------------------|----------------|---------------------|--------------------|-------------------------------------|-----------------------------------|----------------|------------------|
| | R1 | R2 | R3 | R4 | R5 | | | | | | | | | Load Life (4) | Shelf Life (5) | Over-Voltage (6) |
| 1776-C67 | 9 Meg | 900 K | 90 K | 9 K | 900 | 10 | 1200 | 0.1 | 0.1 | 30 | 10 | Range 1 | 0.04 | 0.01 | 0.003 | 0.005 |
| 1776-C671 | 9 Meg | 900 K | 90 K | 9 K | 900 | 10 | 1200 | 0.1 | 0.05 | 30 | 10 | Range 1 | 0.04 | 0.01 | 0.003 | 0.005 |
| 1776-C6715 | 9 Meg | 900 K | 90 K | 9 K | 900 | 10 | 1200 | 0.1 | 0.05 | 30 | 5 | Range 1 | 0.04 | 0.01 | 0.003 | 0.005 |
| 1776-C68 | 9 Meg | 900 K | 90 K | 9 K | 1 K | 10 | 1200 | 0.1 | 0.1 | 30 | 10 | Range 1 | 0.04 | 0.01 | 0.003 | 0.005 |
| 1776-C681 | 9 Meg | 900 K | 90 K | 9 K | 1 K | 10 | 1200 | 0.1 | 0.05 | 30 | 10 | Range 1 | 0.04 | 0.01 | 0.003 | 0.005 |
| 1776-C6815 | 9 Meg | 900 K | 90 K | 9 K | 1 K | 10 | 1200 | 0.1 | 0.05 | 30 | 5 | Range 1 | 0.04 | 0.01 | 0.003 | 0.005 |
| 1776-C48 | 10 Meg | 1.1111M | 101.01K | 10.01K | 1.0001K | 11 | 1200 | 0.1 | 0.1 | 30 | 10 | Range 1 | 0.03 | 0.01 | 0.003 | 0.005 |
| 1776-C481 | 10 Meg | 1.1111M | 101.01K | 10.01K | 1.0001K | 11 | 1200 | 0.1 | 0.05 | 30 | 10 | Range 1 | 0.03 | 0.01 | 0.003 | 0.005 |
| 1776-C4815 | 10 Meg | 1.1111M | 101.01K | 10.01K | 1.0001K | 11 | 1200 | 0.1 | 0.05 | 30 | 5 | Range 1 | 0.03 | 0.01 | 0.003 | 0.005 |
| 1776-C61 | 9 Meg | 900 K | 90 K | 9 K | 900 | 6 | 1200 | 0.1 | 0.1 | 30 | 10 | Range 2 | 0.1 | 0.01 | 0.005 | 0.01 |
| 1776-C611 | 9 Meg | 900 K | 90 K | 9 K | 900 | 6 | 1200 | 0.1 | 0.05 | 30 | 10 | Range 2 | 0.1 | 0.01 | 0.005 | 0.01 |
| 1776-C62 | 9 Meg | 900 K | 90 K | 9 K | 1 K | 6 | 1200 | 0.1 | 0.1 | 30 | 10 | Range 2 | 0.1 | 0.01 | 0.005 | 0.01 |
| 1776-C621 | 9 Meg | 900 K | 90 K | 9 K | 1 K | 6 | 1200 | 0.1 | 0.05 | 30 | 10 | Range 2 | 0.1 | 0.01 | 0.005 | 0.01 |
| 1776-C6217 | 9 Meg | 900 K | 90 K | 9 K | 1 K | 6 | 1200 | 0.1 | 0.02 | 30 | 10 | Range 2 | 0.1 | 0.01 | 0.005 | 0.01 |
| 1776-C742 | 9 Meg | 900 K | 90 K | 9 K | 1 K | 7 | 1200 | 0.25 | 0.25 | 50 | 50 | Range 2 | 0.5 | 0.04 | 0.02 | 0.04 |
| 1776-C74 | 9 Meg | 900 K | 90 K | 9 K | 1 K | 7 | 1200 | 0.1 | 0.1 | 50 | 50 | Range 2 | 0.5 | 0.04 | 0.02 | 0.04 |
| 1776-232 | 9 Meg | 900 K | 90 K | 9 K | 900 | 3 | 1200 | 0.25 | 0.25 | 50 | 50 | Range 2 | 0.3 | 0.04 | 0.02 | 0.04 |
| 1776-23 | 9 Meg | 900 K | 90 K | 9 K | 900 | 3 | 1200 | 0.1 | 0.1 | 50 | 50 | Range 2 | 0.2 | 0.02 | 0.01 | 0.02 |
| 1776-242 | 9 Meg | 900 K | 90 K | 9 K | 1 K | 3 | 1200 | 0.25 | 0.25 | 50 | 50 | Range 2 | 0.3 | 0.04 | 0.02 | 0.04 |
| 1776-24 | 9 Meg | 900 K | 90 K | 9 K | 1 K | 3 | 1200 | 0.25 | 0.1 | 50 | 50 | Range 2 | 0.2 | 0.02 | 0.01 | 0.02 |
| 1776-241 | 9 Meg | 900 K | 90 K | 9 K | 1 K | 3 | 1200 | 0.25 | 0.05 | 50 | 50 | Range 2 | 0.2 | 0.02 | 0.01 | 0.02 |
| 1776-105 | 9 Meg | 900 K | 90 K | 10 K | N/A | 4 | 1200 | +0, -0.5 | 0.1 | 30 | 5 | Range 2 | 0.02 | 0.01 | 0.005 | 0.01 |
| 1776-C10 | 9 Meg | 900 K | 90 K | 10 K | N/A | 9 | 1200 | +0, -0.5 | 0.1 | 30 | 10 | Range 2 | 0.02 | 0.01 | 0.005 | 0.01 |
| 1776-C105 | 9 Meg | 900 K | 90 K | 10 K | N/A | 9 | 1200 | +0, -0.5 | 0.1 | 30 | 5 | Range 2 | 0.02 | 0.01 | 0.005 | 0.01 |
| 1776-1 | 9 Meg | 900 K | 90 K | 10 K | N/A | 2 | 1200 | 0.25 | 0.05 | 30 | 10 | Range 2 | 0.02 | 0.01 | 0.005 | 0.01 |
| 1776-14 | 9 Meg | 900 K | 90 K | 10 K | N/A | 2 | 1200 | 0.25 | 0.1 | 30 | 10 | Range 2 | 0.02 | 0.01 | 0.005 | 0.01 |
| 1776-8 | 9.9 Meg | 90 K | 10 K | N/A | N/A | 1 | 1200 | 0.25 | 0.1 | 30 | 25 | Range 2 | 0.2 | 0.02 | 0.01 | 0.02 |
| 1776-9 | 9.9 Meg | 90 K | 10 K | N/A | N/A | 1 | 1200 | 0.25 | 0.1 | 30 | 10 | Range 2 | 0.02 | 0.01 | 0.005 | 0.01 |
| 1776-91 | 9.9 Meg | 90 K | 10 K | N/A | N/A | 1 | 1200 | 0.25 | 0.05 | 30 | 10 | Range 2 | 0.02 | 0.01 | 0.005 | 0.01 |
| 1776-912 | 9.9 Meg | 90 K | 10 K | N/A | N/A | 1 | 1200 | 0.25 | 0.02 | 30 | 5 | Range 2 | 0.02 | 0.01 | 0.005 | 0.01 |
| 1776-C4 | 10 Meg | 1.1111M | 101.01K | 10.01K | 1.0001K | 8 | 1200 | 0.25 | 0.25 | 30 | 10 | Range 2 | 0.1 | 0.01 | 0.005 | 0.01 |
| 1776-C44 | 10 Meg | 1.1111M | 101.01K | 10.01K | 1.0001K | 8 | 1200 | 0.1 | 0.1 | 30 | 10 | Range 2 | 0.1 | 0.01 | 0.005 | 0.01 |
| 1776-C441 | 10 Meg | 1.1111M | 101.01K | 10.01K | 1.0001K | 8 | 1200 | 0.1 | 0.05 | 30 | 10 | Range 2 | 0.1 | 0.01 | 0.005 | 0.01 |
| 1776-C34 | 10 Meg | 1.1111M | 101.01K | 10.01K | 1.0001K | 8 | 1200 | 0.25 | 0.25 | 50 | 50 | Range 2 | 0.5 | 0.04 | 0.02 | 0.04 |
| 1776-C532 | 900 K | 90 K | 9 K | 900 | N/A | 5 | 750 | 0.25 | 0.25 | 25 | 25 | Range 2 | 0.4 | 0.02 | 0.01 | 0.02 |
| 1776-C53 | 900 K | 90 K | 9 K | 900 | N/A | 5 | 750 | 0.1 | 0.1 | 25 | 15 | Range 2 | 0.3 | 0.02 | 0.01 | 0.02 |
| 1776-C542 | 900 K | 90 K | 9 K | 1 K | N/A | 5 | 750 | 0.25 | 0.25 | 25 | 25 | Range 2 | 0.4 | 0.02 | 0.01 | 0.02 |
| 1776-C54 | 900 K | 90 K | 9 K | 1 K | N/A | 5 | 750 | 0.1 | 0.1 | 25 | 15 | Range 2 | 0.3 | 0.02 | 0.01 | 0.02 |
| 1776-C541 | 900 K | 90 K | 9 K | 1 K | N/A | 5 | 750 | 0.1 | 0.05 | 25 | 15 | Range 2 | 0.3 | 0.02 | 0.01 | 0.02 |

Specifications:

(Numbers inside circles reference columns in Model No. table)

- ① **Ratio Tolerance:** Maximum ratio error. (See the specific Figures for the Ratio Definition).
- ② **Ratio Temperature Coefficient:** Maximum ratio TC error. (See the specific Figures for the Ratio Definition).
Range 1: -40°C to +85°C.
Range 2: 0°C to +70°C.
- ③ **Voltage Coefficient of Ratio (ppm/volt):** R1 in series with any combination of R2, R3, R4, and R5, 100 volts to rated voltage.
- ④ **Load Life:** Ratio stability of resistance under full load at +70°C, rated voltage applied to R1 in series with any combination of R2, R3, R4, and R5 for 2000 hrs.
- ⑤ **Shelf Stability of Ratio:** Six months at shelf conditions.
- ⑥ **Overvoltage:** Maximum voltage of 1.67 times rated DC voltage. Volts DC or peak AC applied to R1 and any combination of R2, R3, R4, and R5 in series with R1 for 10 seconds.
- ⑦ **Voltage Rating:** DC or RMS AC voltage applied to R1 in series with any combination of R2, R3, R4, and R5.

Storage Temperature: -40°C to +85°C.

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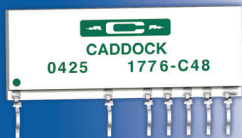
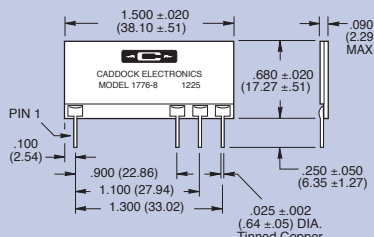


Figure 1



RATIO DEFINITION:
ALL RESISTORS RATIO ONE ANOTHER

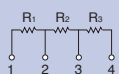
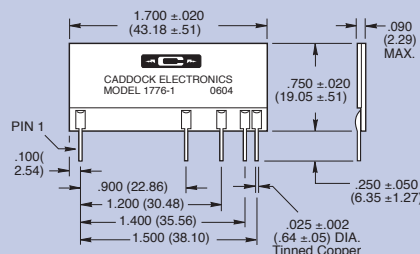


Figure 2



RATIO DEFINITION:
ALL RESISTORS RATIO ONE ANOTHER

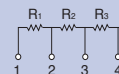
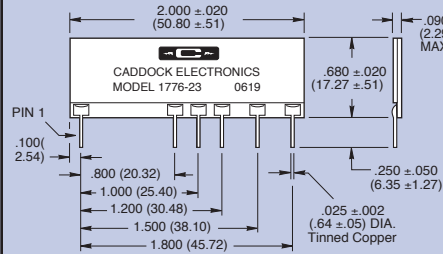


Figure 3



RATIO DEFINITION:
ALL RESISTORS RATIO ONE ANOTHER

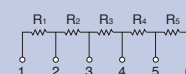
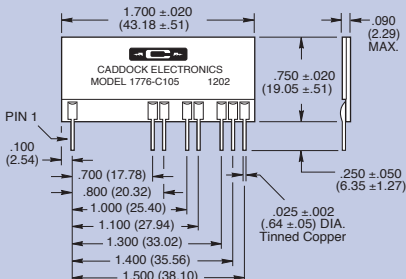


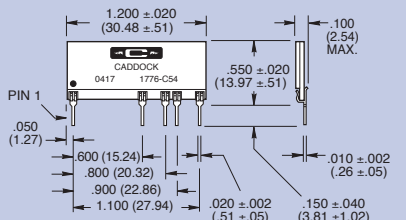
Figure 4



RATIO DEFINITION:
ALL RESISTORS RATIO ONE ANOTHER



Figure 5



RATIO DEFINITION:
ALL RESISTORS RATIO ONE ANOTHER

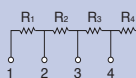
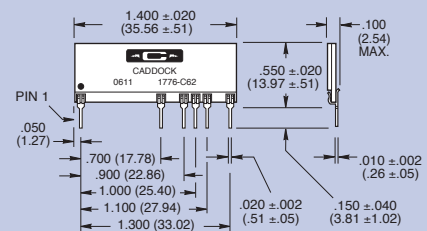


Figure 6



RATIO DEFINITION: Where $R_T = R_1 + R_2 + R_3 + R_4 + R_5$
RATIO 1 $(R_2 + R_3 + R_4 + R_5):R_T$
RATIO 2 $(R_3 + R_4 + R_5):R_T$
RATIO 3 $(R_4 + R_5):R_T$
RATIO 4 $(R_5):R_T$

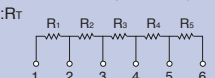
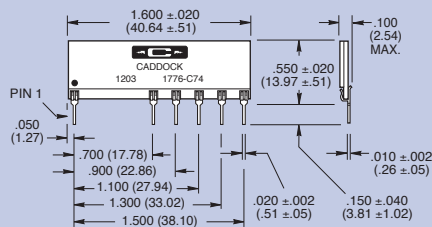


Figure 7



RATIO DEFINITION:
ALL RESISTORS RATIO ONE ANOTHER

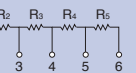
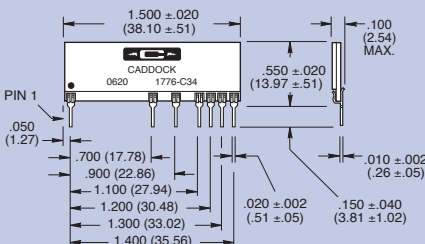


Figure 8



RATIO DEFINITION:
RATIO 1 $R_1:R_2$
RATIO 2 $R_1:R_3$
RATIO 3 $R_1:R_4$
RATIO 4 $R_1:R_5$

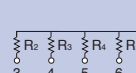
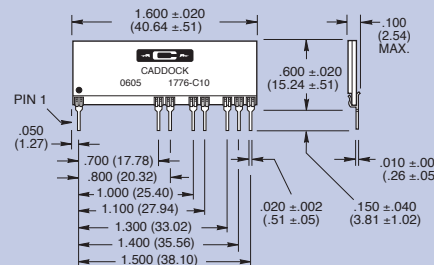


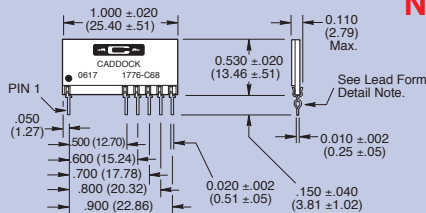
Figure 9



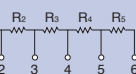
RATIO DEFINITION:
ALL RESISTORS RATIO ONE ANOTHER



Figure 10



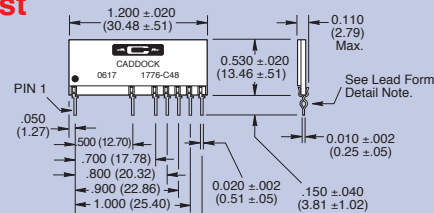
RATIO DEFINITION: Where $R_T = R_1 + R_2 + R_3 + R_4 + R_5$
RATIO 1 $(R_2 + R_3 + R_4 + R_5):R_T$
RATIO 2 $(R_3 + R_4 + R_5):R_T$
RATIO 3 $(R_4 + R_5):R_T$
RATIO 4 $(R_5):R_T$



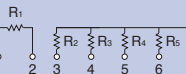
New Smaller Models at Lower Cost

Lead Form Detail Note: Lead form detail provides interference in the circuit board hole to achieve a vertical mount of the device. Recommended circuit board hole is nominally 0.039 inch (.99 mm).

Figure 11



RATIO DEFINITION:
RATIO 1 $R_1:R_2$
RATIO 2 $R_1:R_3$
RATIO 3 $R_1:R_4$
RATIO 4 $R_1:R_5$



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