

Wheatstonesche Brücke

Wert 11

Funktionsgenerator: $U_0 = 10V$, $1kHz$

$$R_u = 1k\Omega - R_3$$

1.) $R_2 = \cancel{664} 664\Omega$ $R_3 = 425,25\Omega$

2.) $R_2 = 1k\Omega$ $R_3 = 330\Omega$

3.) $R_2 = 332\Omega$ $R_3 = 5595,5\Omega$

Kapazitätsmessbrücke

Wert 9

F-Generator: $U_0 = 10V$, $1kHz$

1.) $R_2 = 2k\Omega$ $R_3 = 798\Omega$

2.) $R_2 = 3k\Omega$ $R_3 = 880\Omega$

3.) $C_2 = 592nF$ $R_2 = 1k\Omega$
 $R_3 = 694\Omega$

4.) $C_2 = 557nF$ $R_2 = 3k\Omega$
 $R_3 = 694\Omega$

$$R_u = 1k\Omega - R_3$$

Zu 1.) und 2.):

$$C_2 = 992nF$$

Beobachtung: Es war kein Minimum, sondern
Rand von Voltmeter

V.353

15.12.2020

4a) $f = 999Hz$

RC-Entladekurve:

| t | U | t | U |
|------------|-------------------------|----------------------------|-------|
| 0 | 2,1V | 80 μs | 1,1V |
| 10 μs | 1,9V 1,9V | 90 μs | 0,9V |
| 20 μs | 1,8V | 100 μs | 0,8V |
| 30 μs | 1,7V | 110 110 μs | 0,4V |
| 40 μs | 1,55V | 120 150 μs | 0,3V |
| 50 μs | 1,4V | 130 160 μs | 0,25V |
| 60 μs | 1,3V | 140 120 μs | 0,65V |
| 70 μs | 1,2V | | |

4b)

Generatorspannung $U_0 = 4,2 \text{ V}$

| f | Kond. spann., A |
|----------|-----------------|
| 420 Hz | 2,75/2 V |
| 4,22 kHz | 160 mV |
| 41,8 kHz | 17 mV |
| 500 Hz | 12 V |
| 5,03 kHz | 135 mV |
| 49,8 kHz | 14,5 mV |
| 600 Hz | 1 V |
| 6,03 kHz | 112,5 mV |
| 59,8 kHz | 12 mV |
| 700 Hz | 0,85 V |
| 7,04 kHz | 97,5 mV |
| 69,7 kHz | 10,5 mV |
| 800 Hz | 0,8 V |
| 8,04 kHz | 85 mV |
| 79,6 kHz | 9 mV |

c) Phasenverschiebung

| f | in μs (a, b) | | TIME/DIV |
|---------|-------------------------|------|-------------------|
| 1058 Hz | 0.8 | 3.95 | 0.1 ms |
| 2 kHz | 0.95 | 4 | 50 μs |
| 3 kHz | 1.6 | 7 | 20 μs |
| 10 kHz | 1.0 | 4.2 | 10 μs |
| 126 kHz | 1.5 | 6.8 | 0.5 μs |
| 420 Hz | 1 | 5.1 | 0.2 ms |
| 323 Hz | 1.1 | 6.8 | 0.5 ms |
| 280 Hz | 1.2 | 7.8 | " " |

$$\phi = \frac{a}{b} \cdot 2\pi$$

Frequenz Phasenverschiebung

| f | 230 Hz | 180 Hz | 130 Hz | 80 Hz | 50 Hz | 40 Hz |
|---|--------|--------|--------|-------|-------|---------------------|
| a | 0.5 | 0.65 | 0.7 | 0.4 | 0.2 | 0.5 |
| b | 3.8 | 4.8 | 6.6 | 5.5 | 4.4 | 5.5 10.4 |
| | 0.5 ms | " | | | | |

Integratorfunktion

P.V.