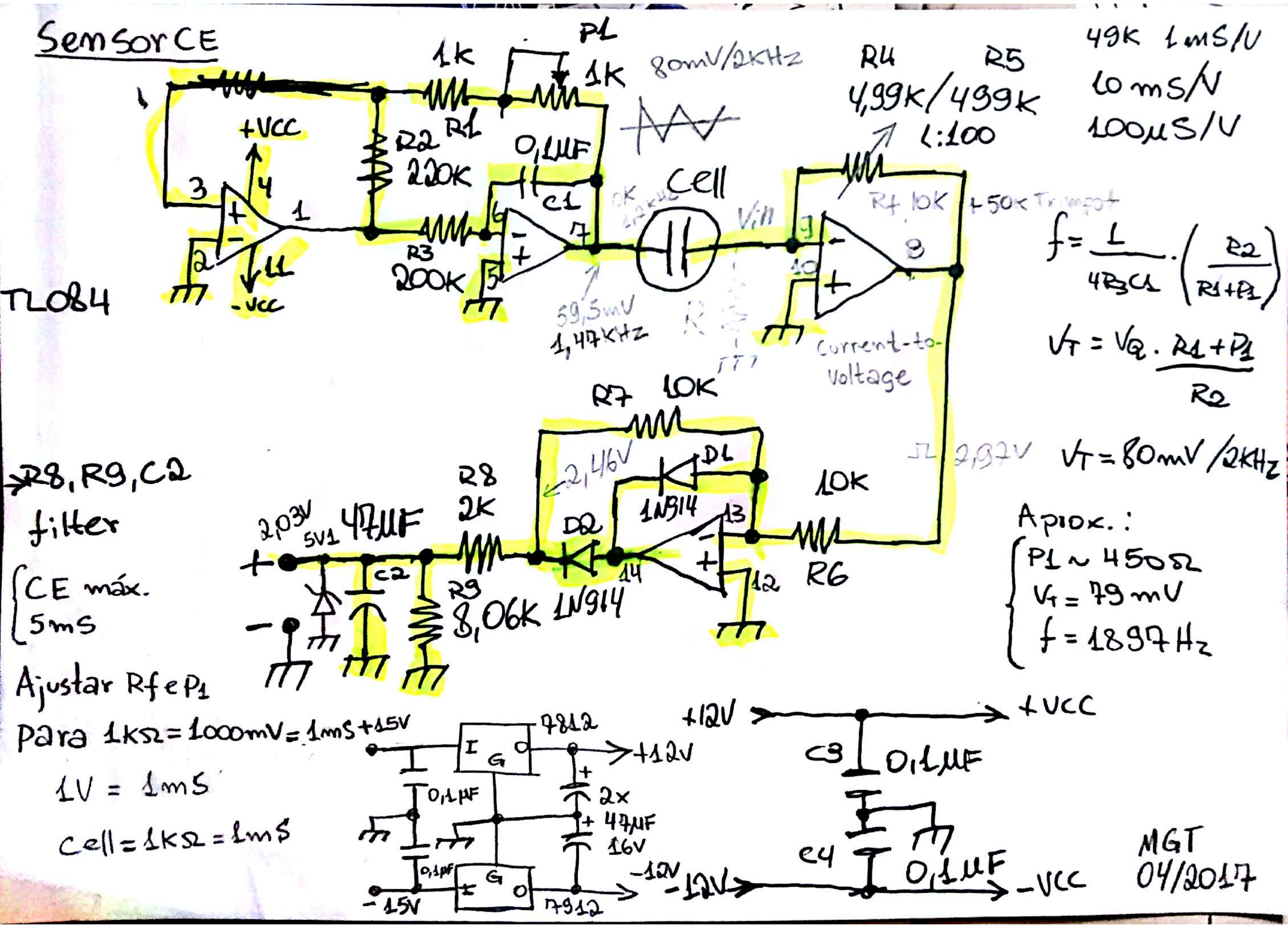
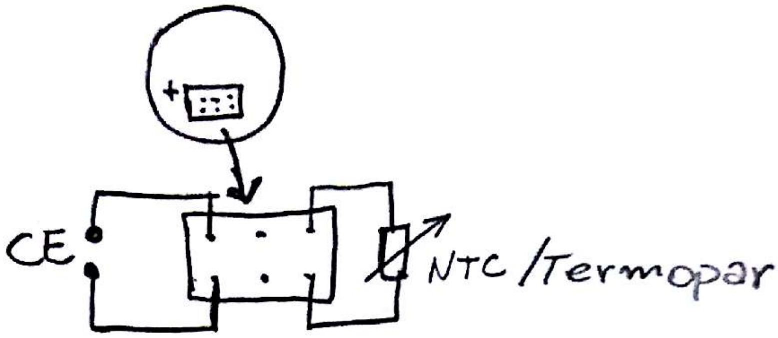

Sensorce
TL084
+VCC
-VCC
R2 220K
R1 1k
P1 1K
0,1µF C1
R3 200K
80mV/2KHz
Cell
59,5mV
1,47KHz
Vi
R4 R5
4,99K/499K
1:100
Rf 10K +50K Trimpot
Current-to-Voltage
49K 1mS/V
10mS/V
100µS/V
f = 1/(4R3C1) · (R2/(R1+P1))
VT = VQ · (R1+P1)/R2
VT = 80mV/2KHz
Aprox.:
P1 ~ 450Ω
VT = 79 mV
f = 1897 Hz
R7 10K
D1 1N914
2,46V
2,97V
10K R6
D2 1N914
R8 2K
R9 8,06K
47µF C2
5V1
2,03V
R8, R9, C2 filter
CE máx. 5mS
Ajustar Rf e P1
Para 1kΩ = 1000mV = 1mS
1V = 1mS
Cell = 1kΩ = 1mS
+15V
7812
+12V
0,1µF
2x 47µF 16V
0,1µF
-15V
7912
-12V
+12V
+VCC
C3 0,1µF
C4 0,1µF
-12V
-VCC
MGT
04/2017

AK50 - AK51

*Probe pinout



condutance:

$$G = \frac{1}{R} \; [S]$$

Cell constant:

$$K = \frac{d}{a}$$

K = cell constant (cm^{-1})
a = effective area of the electrodes (cm^2)
d = distance between the electrodes (cm)

$\begin{cases} K = Q \\ \text{vessel constant} \end{cases}$

Condutivity:

$$\kappa = G \cdot K$$

$$\boxed{\kappa = G \cdot Q}$$

κ = condutivity (S/cm)
G = condutance (s)
K = Cell constant (cm^{-1})

$$Q = \frac{d}{a}$$

Correção da temperatura

$$K_{Tref} = \frac{100}{100 + \theta.(T - T_{Ref})} \cdot K_T$$

K_{Ref} = Condutivity at T_{Ref}

K_T = Condutivity at T

T_{Ref} = Reference temperature

T = sample temperature

θ = Temperature coefficient

Usually $T_{Ref} = 25°C$

→ Determination of θ

Measuring the condutivity of a sample temperature T_1 close to T_{Ref} and another temperature T_2, use the following equation:

$$\theta = \frac{(K_{T2} - K_{T1}).100}{(T_2 - T_1) \cdot K_{T1}}$$

* T_2 should be selected as a typical sample temperature and should be approx. 10°C different from T_1

Condutance:

$$G = \frac{1}{R} \; [S] \qquad (1)$$

Cell constant:

$$Q = \frac{d}{a} \; [cm^{-1}] \qquad (2) \qquad\qquad K = \frac{1}{R} \cdot \frac{d}{a} \; [S/cm]$$

Condutivity:

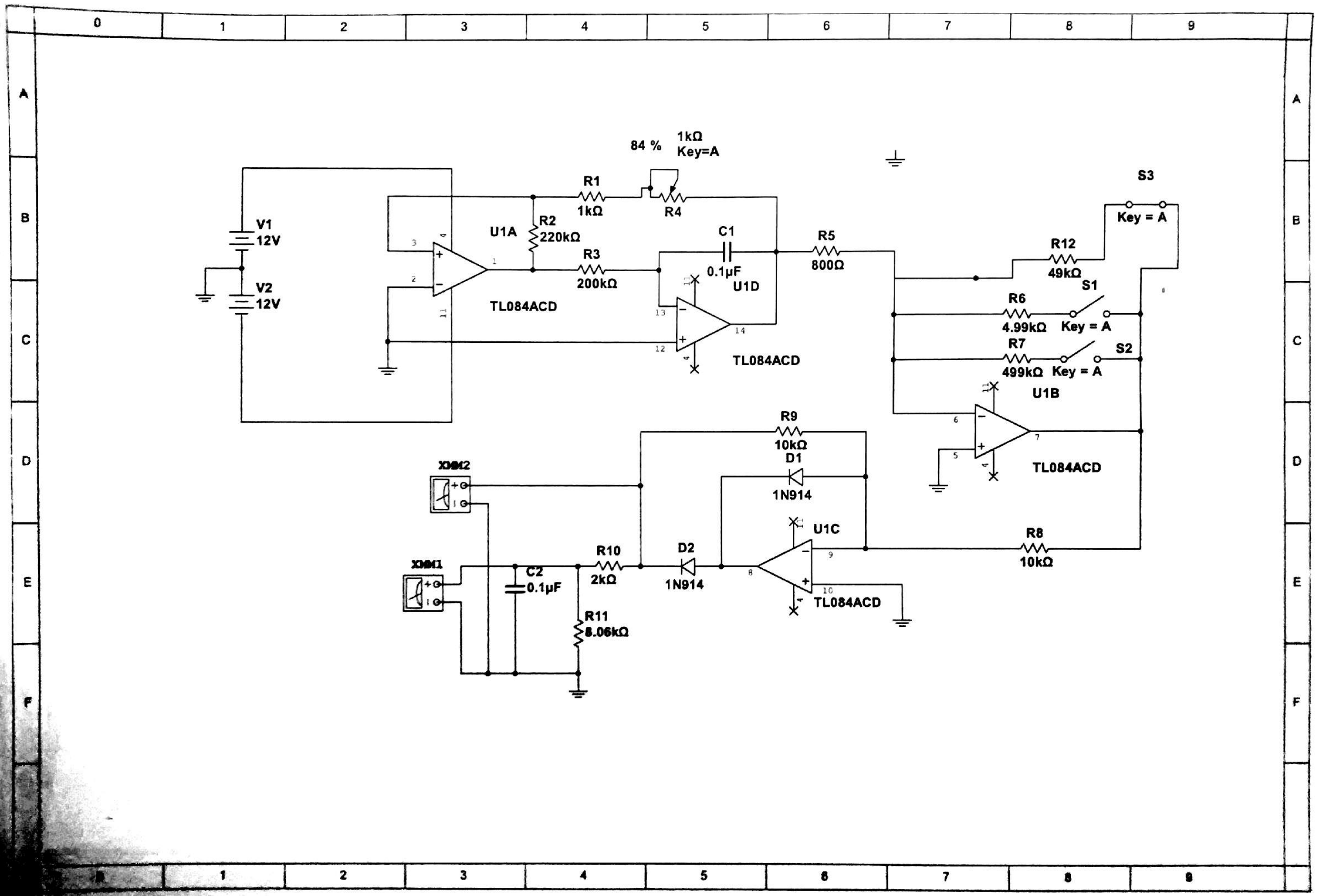
$$K = G \cdot Q \; [S/cm]$$

Condutivity at T_{Ref}:

$$K_{Tref} = \frac{100}{100 + \Theta(T - T_{Ref})} \cdot K_T$$

$$\boxed{K_{Tref} = \frac{100 \, G Q}{100 + \Theta(T - T_{Ref})}}$$

$$\Theta = \frac{(K_{T2} - K_{T1}) \cdot 100}{(T_2 - T_1) \cdot K_{T1}}$$



84 %
1kΩ
Key=A
R1
1kΩ
R4
V1
12V
V2
12V
U1A
R2
220kΩ
R3
200kΩ
C1
0.1µF
U1D
TL084ACD
TL084ACD
R5
800Ω
S3
Key = A
R12
49kΩ
S1
R6
4.99kΩ
Key = A
R7
499kΩ
Key = A
S2
U1B
TL084ACD
R9
10kΩ
D1
1N914
XMM2
XMM1
C2
0.1µF
R10
2kΩ
D2
1N914
R11
8.06kΩ
U1C
TL084ACD
R8
10kΩ