



Department Of electrical and computer Engineering
ENEE2103 CIRCUITS AND ELECTRONICS LABORATORY

Experiment No.6 Prelab

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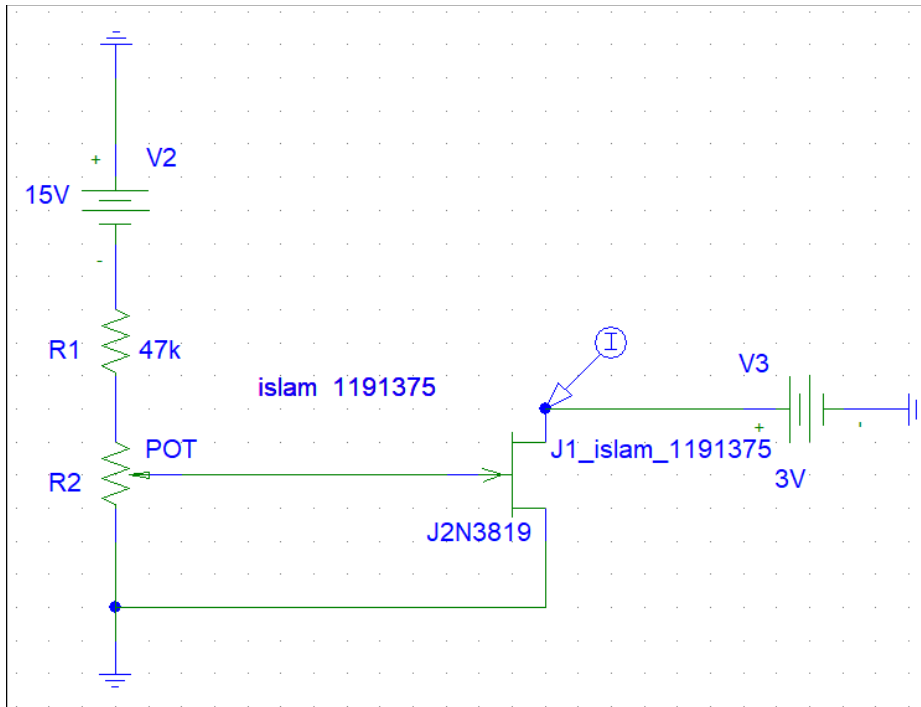
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TA: MR. Ismail Abualia

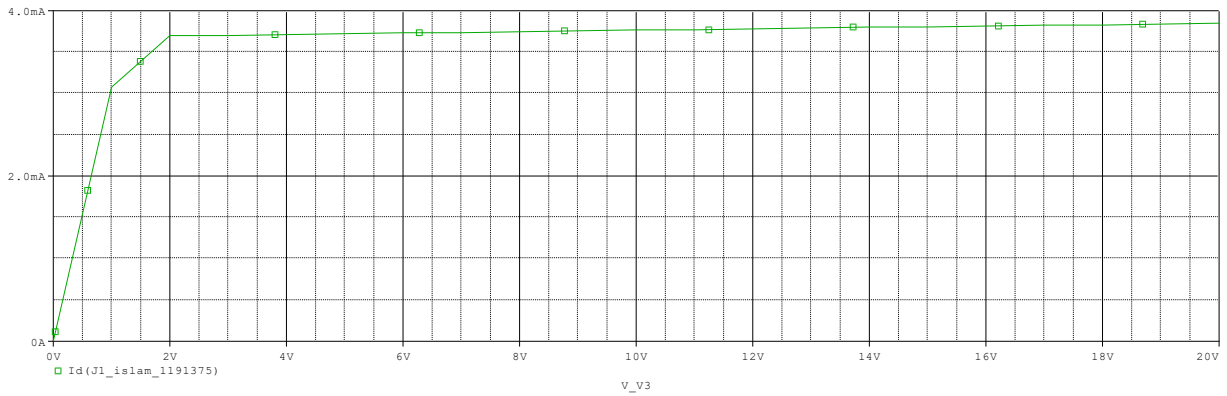
Date: 11/Oct/2021

I. CHARACTERISTICS OF AN N-CHANNEL JFET.

I_{DS} as function of V_{DS}



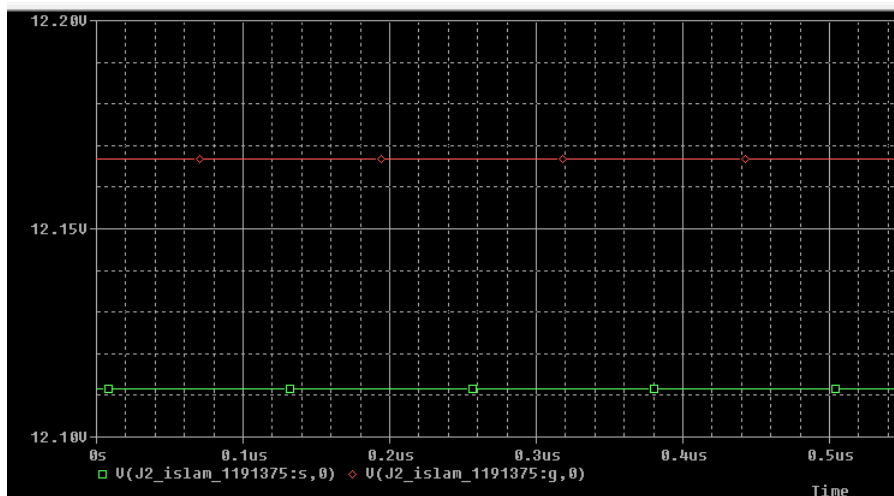
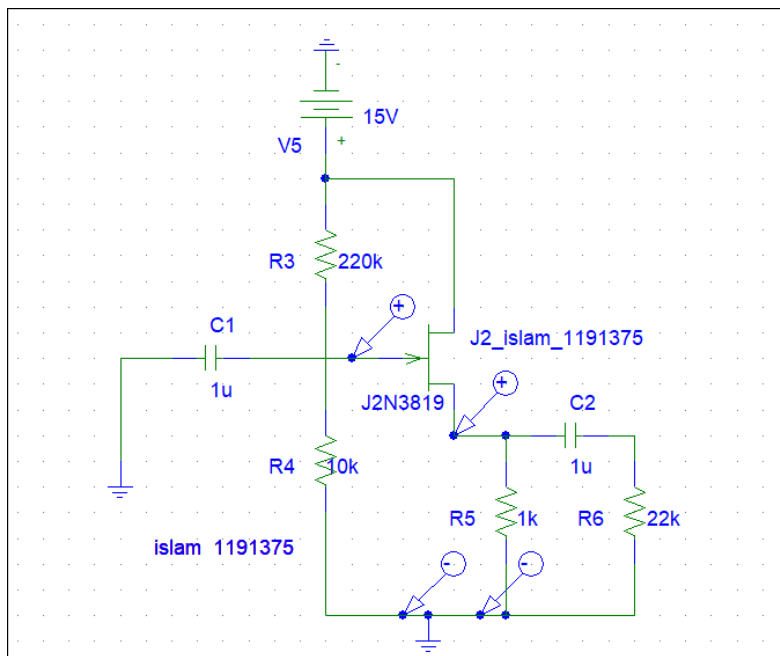
The graph of it simulating from 0-20 volts

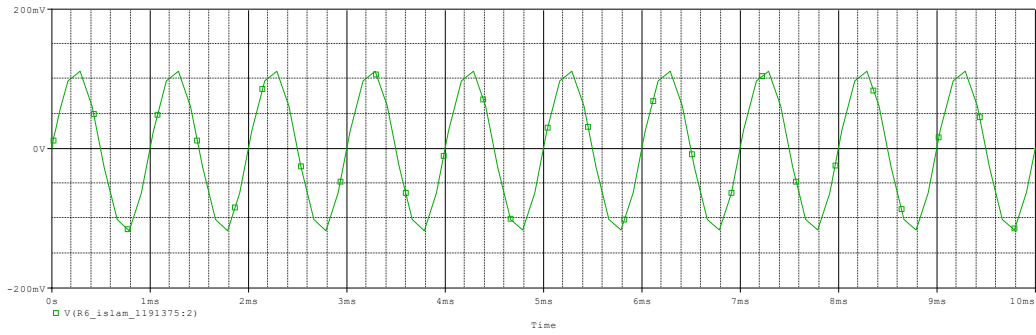
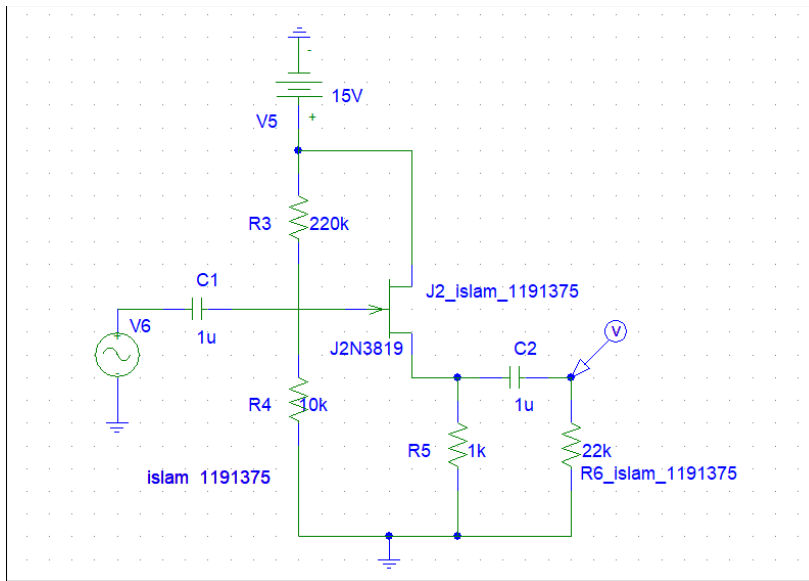


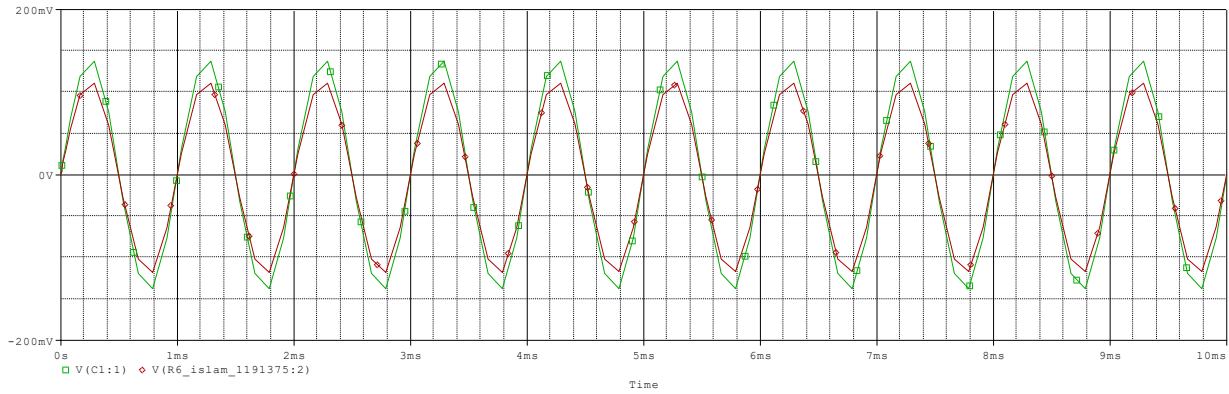
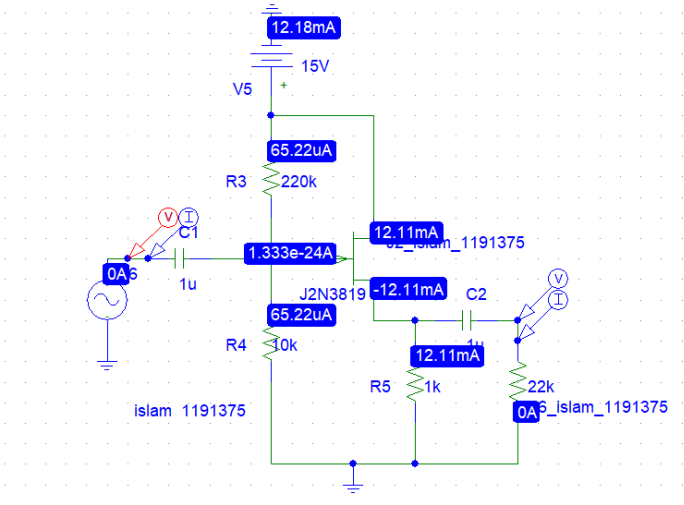
- From your graph, above which values of V_{DS} is I_D almost unaffected by V_{DS} when $V_{GS}=0$?
Almost from 2 volts and up
- For a given value of V_{DS} , (say 10 V), do equal changes of V_{GS} cause equal changes of I_D ?
No
- Can you measure I_G or is it too small?
It's almost zero
- From your graph, estimate the change in I_D for 0.5 change in V_{GS} when $V_{DS} = 10$ V, and $V_{GS} = -1.0$ V, then find the transconductance of the transistor (g_m).

when $V_{DS} = 10 \text{ V} \rightarrow I_d = 4 \text{ mA}$, $g_m = \Delta I_d / \Delta V_{ds} = (2.4754 - 655.738 \text{m} / 3.7018 \text{m} - 2.0172 \text{m}) = 1.08$

II. COMMON DRAIN AMPLIFIER.







voltage gain= $V_o/V_i = 0.2/8.18=40.9V$

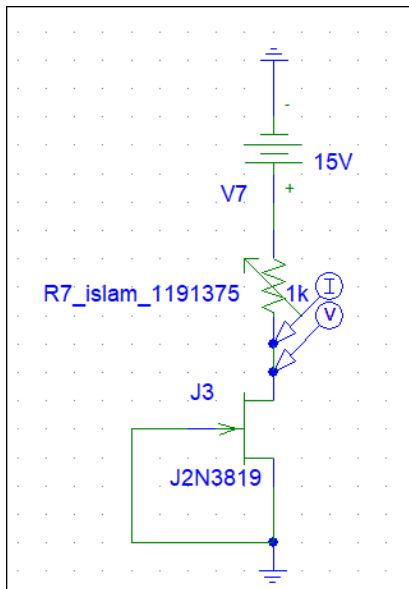
from the graph the phase shift =0 as seen

$Z_{in} = 33$

$Z_{out} = 50M \text{ ohm}$

By putting V test and I test from the output side and by the formula theoretically

III. CONSTANT CURRENT SOURCE.



$R_L(K\Omega)$	$V_L(V)$	$I_D(mA)$
0.1	1.2	12
0.22	2.63	11.97
0.33	3.85	11.93
0.47	5.6	11.89
0.56	6.7	11.86
1	11.8	11.73
1.5	13.6	8.96
2	14	6.951
3	14.1	4.767

Table 8.2