### American International University- Bangladesh

**Department of Electrical and Electronic Engineering**

**EEE 2104: Electronic Devices Laboratory**

**Title:** Performance analysis of a common source (CS) E-MOSFET amplifier circuit by varying the loads and justification of the analysis with respect to simulated and experimental data (followed by the given constraints).

**Objective:** Using basic concepts of MOSFET characterization and after sufficient literature survey, students will design a common source E-MOSFET amplifier circuit and analyze the gain with varying the loads. Finally, a complete analysis will be expected with respect to experimental and simulated data.

**Instructions:**

* Gather adequate knowledge about the experiment by thorough literature review.
* Construct the CS E-MOSFET amplifier in lab with appropriate apparatus.
* Choose parameter values accordingly with proper reasoning behind choosing so.
* Determine the voltage gain Av with different load resistors.
* Include the experimental set-up and simulation of the experiment in your report and compare it with the experimental results.
* Limitation along with the hypothesis to overcome the obstacles and explanation of any uncertainties and/or outliers/questionable data must be stated in discussion and conclusion section.

**OEL report:**

After completing the experiment, students will generate a report which will include the following sections:

* Experiment title
* Objective of the experiment
* Literature review
* Circuit diagram
* Apparatus list with proper values (where applicable)
* Result
  + Experimental data table
  + Simulated data table
* Data interpretation and analysis
* Discussion and conclusion
* Reference (IEEE style).

**Rubric to be followed for evaluation (to be filled by faculty):**

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| --- | --- | --- | --- | --- | --- |
| **Category** | Proficient  [4] | Good  [3] | Acceptable  [2] | Unacceptable [0-1] | Secured Marks |
| State of Art  **(K2)** | Thorough study of the concepts and identification of principles that can answer all the possible questions correctly | Background knowledge is not sufficient to carry on the experiment although the proper concepts and principles identified, with minor error | Background studies are inadequate and concept is not clear | Incorrect identification of problem with no or very little background knowledge. |  |
| Selection of Appropriate Tools and Methods | Relevant and smart selection of equipment along with proper methodology to achieve desired objectives | Selection of equipment and methodology is satisfactory with little reasoning mentioned | Selection process is not adequate with little reasoning mentioned | Selection process is faulty with unnecessary and irrelevant choice and no reasoning mentioned. |  |
| Data validity and Interpretation  **(K8)** | All of the criteria are met; completion of hardware implementation and simulation is correct; results are described clearly and accurately with proper interpretation of data | Most criteria are met, but there may be some lack of clarity and/or incorrect information. Hardware and software implementation is correct | Analysis and results do not match exactly with the theoretical values and/or analysis is unclear. Experimental setup and simulation are somewhat faulty | Analysis and solution are missing or incorrect. Experimental setup and simulation are incorrect |  |
| Limitation and Conclusion | Findings are summarized correctly. Conclusions drawn are appropriate for analyses with adequate recommendation included | Hypotheses are clearly stated, but some concluding statements not be supported by data or data not well integrated | Some hypotheses missing or misstated; conclusions not supported by data | Conclusions do not match hypotheses and not supported by results |  |
| Report Writing | Report meets all the requirements and is prepared in original and creative way to engage readers. Referencing is correct and sufficient | Writing is clear and easy to understand; ideas are connected; referencing is correct | Most of the required criteria are met, but some lack of clarity; referencing is insufficient | Required criteria are not met with very little to no proper referencing |  |
| Comments: |  | | | Total Marks  (Out of 20): |  |