



EEM 303 Electronic II Laboratory 3

E-VMOSFET Characteristics II

Student Name	Student ID	Group Number
1.
2.
3.
4.

Objective:

To understand output characteristics of E-VMOSFETs and their operations.

Equipment will be available at the laboratory:

DC power supply, Oscilloscope, Electronic Training Set(Y-0016), Patch wires,

Equipment will be ensured by students:

Digital Multi-Meter

Preliminary Work:

Read the laboratory sheets. There might be a test or classical exams in the beginning of each laboratory hour. Questions will be asked mostly from *Supplementary Information* and *Procedure* sections.

The behaviors of a MOSFET transistor in depletion and enhancement modes depending on the gate voltage should be summarized with a table and also, documented into A4 paper and given to instructor(s) at beginning of laboratory hour.

Procedure:

1. Insert the Y-0016-012 module into training set.
2. Connect the patch wires to the module as it is shown in Figure 2.
3. Turn the power on for Y-0016 Training Set.

Output Characteristics of E-VMOSFETs

4. Adjust the V_{DD} voltages to the values in Figure 4 by using Adjustable DC Power Supply,
5. Record I_D values respectively for each step of V_{GS} voltage and fill the table in the Figure 4,
6. Sketch the V_{DD} and the I_D curves into Figure 5 for each V_{GS} voltage.

Operating states of E-VMOSFETs

7. Connect the patch wires to the module as it is shown in Figure 3.
8. Make J2 terminals short circuit and turn the power on,
9. Measure V_{DS} and V_{GS} voltages and determine its operating states accordingly,
10. Remove connected J2 terminal wires, make J1 terminals short circuit,
11. Measure V_{DS} and V_{GS} voltages and determine its operating states accordingly,

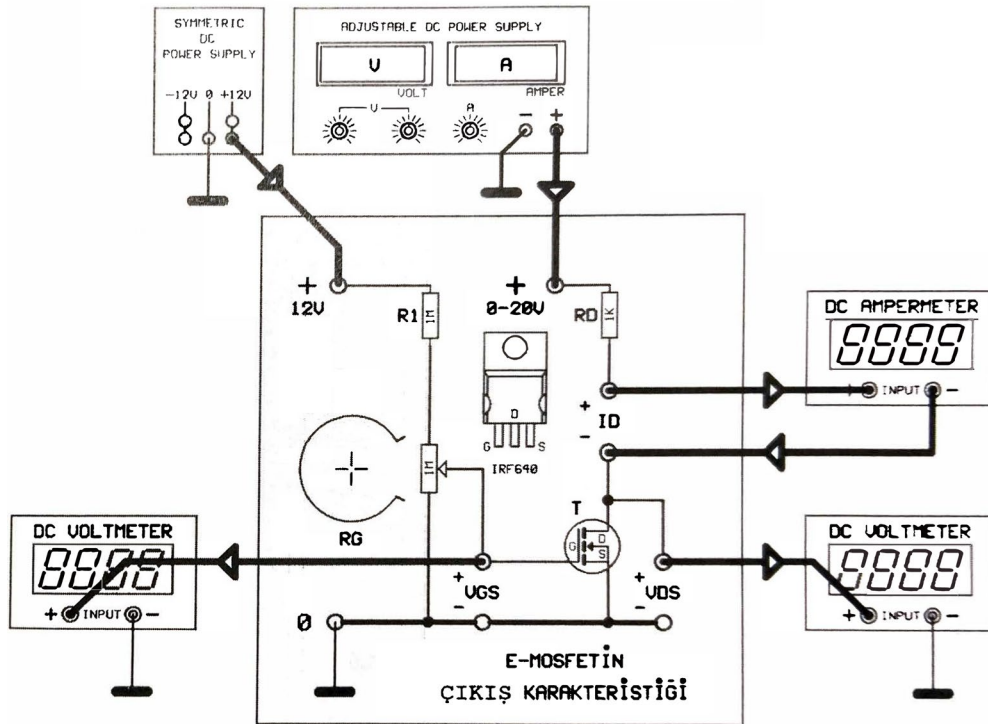


Figure 2: Connection scheme of E-VMOSFET output characteristic circuit.

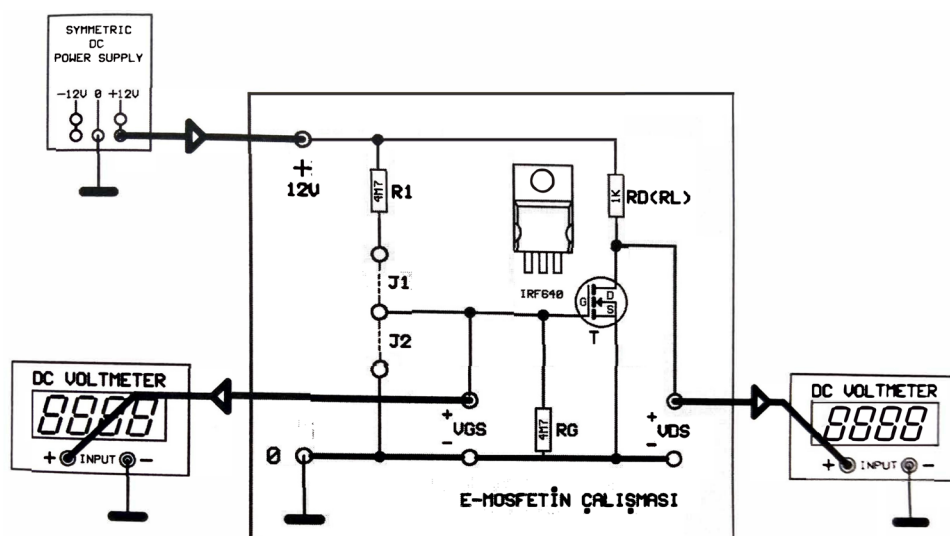


Figure 3: Connection scheme of E-VMOSFET operation states circuit.

Results:

Output Characteristics of E-VMOSFET

$V_{GS} = 0V$ (Constant)		$V_{GS} = 2V$ (Constant)		$V_{GS} = 4V$ (Constant)		$V_{GS} = 5V$ (Constant)	
V_{DD} (Volt)	I_D (mA)	V_{DD} (Volt)	I_D (mA)	V_{DD} (Volt)	I_D (mA)	V_{DD} (Volt)	I_D (mA)
1		1		1		1	
2		2		2		2	
3		3		3		3	
4		4		4		4	
5		5		5		5	
10		10		10		10	
15		15		15		15	
20		20		20		20	

Figure 4: I_D current values with respect to V_{DD} voltages at constant V_{GS} voltage

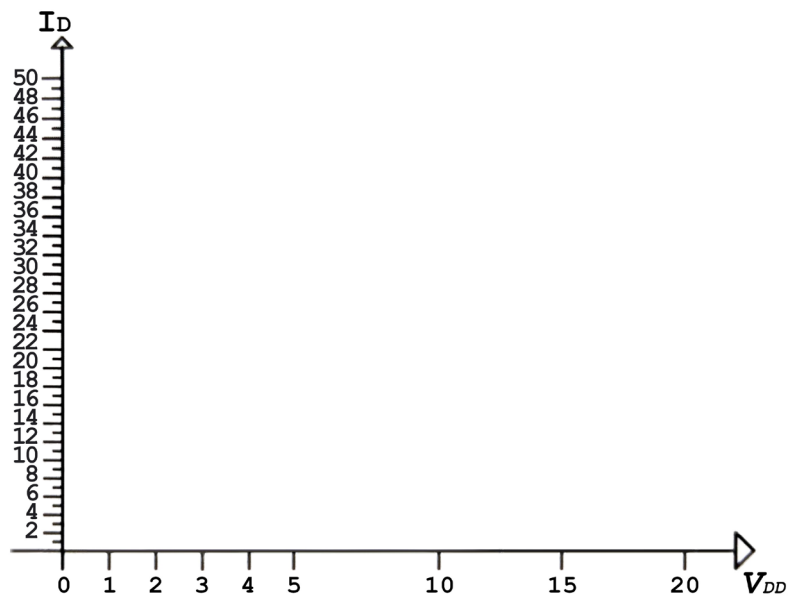


Figure 5: Sketch of I_D current values with respect to V_{DD} voltages at constant V_{GS} voltages

Conclusion: