ELECTRONICS LAB.

PART 8 EXPERIMENTS

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EXPERIMENT 8.1

DERIVING INPUT CHARACTERISTICS OF E-VMOSFET

EXPERIMENTAL PROCEDURE:

Plug the Y-0016/013 smodule. Make the circuit connections as in figure 17.24

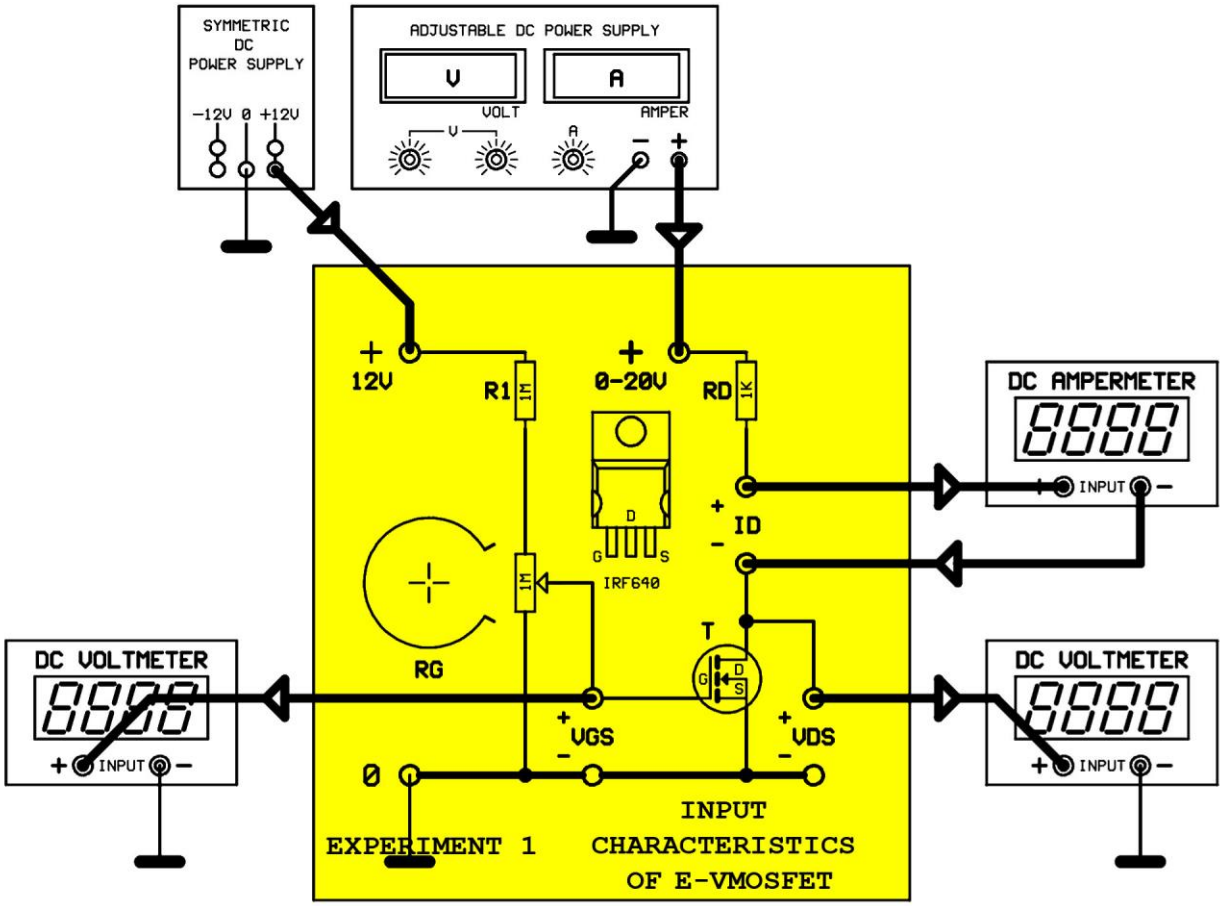

Figure 17.24

1-Adjust the VGS voltage to zero with the help of RG potentiometer. Adjust **VDD=VDS** voltage to 20Volt in power supply.

2-Adjust the VGS voltage to the values in table in figure 17.25 by the help of RG potentiometer. Type the drain current (**ID**) at each step. Draw the VGS/ID curve.

VDD=20V CONSTANT			
VGS (VOLT)	ID (mA)	VGS (VOLT)	ID (mA)
0.0		3.1	
2.0		3.2	
2.5		3.3	
2.8		3.4	
2.9		3.5	
3.0		4.0	

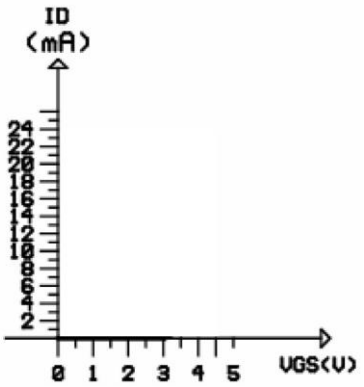

Figure 17.25

3- At which VGS values did the E-VMOSFET start transmission and reach saturation?

*To transmission at **VGS=**……Volt, to saturation at **VGS=**……..Volt*

4-How much is the drain current (**ID**) at saturation? Why?

***ID=**……mA. The reason is ……*

5-How much is the VDS voltage of E-VMOSFET at saturation? What happens to the resistance of E-VMOSFET at that moment?

*It is **VDS=**……..mV at saturation. The reason is …… ……*

6-Repeat the experiment after adjusting **VDD=**10Volt. Type drain currents (**ID**) of each step to table in figure 17.26

VDD=10V CONSTANT			
VGS (VOLT)	ID (mA)	VGS (VOLT)	ID (mA)
0.0		3.1	
2.0		3.2	
2.5		3.3	
2.8		3.4	
2.9		3.5	
3.0		4.0	

Figure 17.26

7-What happened to transmission and saturation points of E-VMOSFET after changing the VDD voltage? Compare the new value with VGS value at **VDD=**20Volt.

*To transmission at **VGS=**……Volt and to saturation at **VGS=**……..Volt. Transmission and saturation points of VMOSFET …….*

EXPERIMENT 8.2

DERIVING OUTPUT CHARACTERISTICS OF E-VMOSFET

EXPERIMENTAL PROCEDURE:

Plug the Y-0016/013 module. Before making the circuit connections, adjust output voltage of power supply to "**0**" (rotate voltage potentiometer to left) and adjust gate voltage to "**0**" (rotate "**RG**" potentiometer to left).

Make the circuit connections as in figure 17.29 and apply energy to circuit.

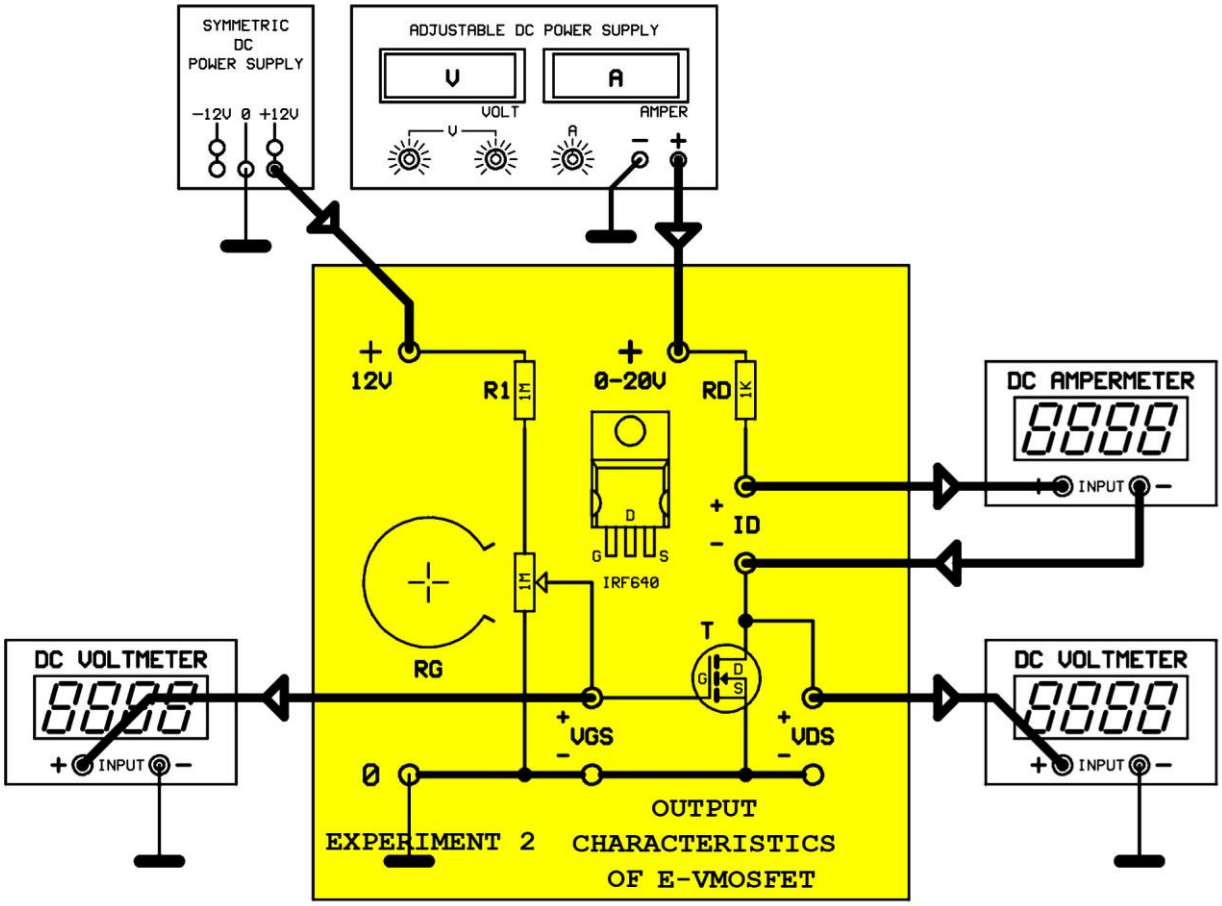

Figure 17.29

1-Adjust **VGS=**0 by the help of "**RG**" potentiometers. Adjust the voltage of power supply to the values at the table in figure 17.30, respectively. Type the ID value at each step to the related section. Complete the table by adjusting to **VGS=**2Volt, **VGS=**4Volt, **VGS=**5Volt

VGS=0 CONSTANT	
VDD (VOLT)	ID (mA)
1	
2	
3	
4	
5	
10	
15	
20	

VGS=2 CONSTANT	
VDD (VOLT)	ID (mA)
1	
2	
3	
4	
5	
10	
15	
20	

VGS=4 CONSTANT	
VDD (VOLT)	ID (mA)
1	
2	
3	
4	
5	
10	
15	
20	

VGS=5 CONSTANT	
VDD (VOLT)	ID (mA)
1	
2	
3	
4	
5	
10	
15	
20	

Figure 17.30

2- Draw the change graphics between VDD/ID axes like in figure 17.31

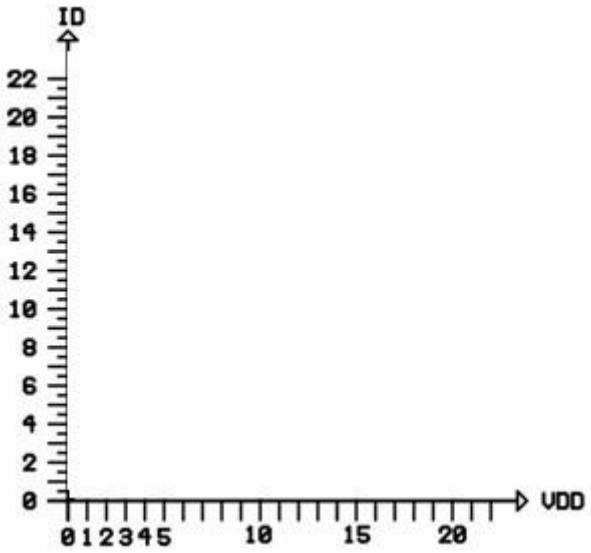

Figure 17.31

3- How is the change of VDD/ID?

4- What restricts the drain current?

EXPERIMENT 8.3

EXAMINATION OF E-VMOSFET's OPERATION

EXPERIMENTAL PROCEDURE:

Plug the Y-0016/013 module. Make the circuit connections as in figure 17.33

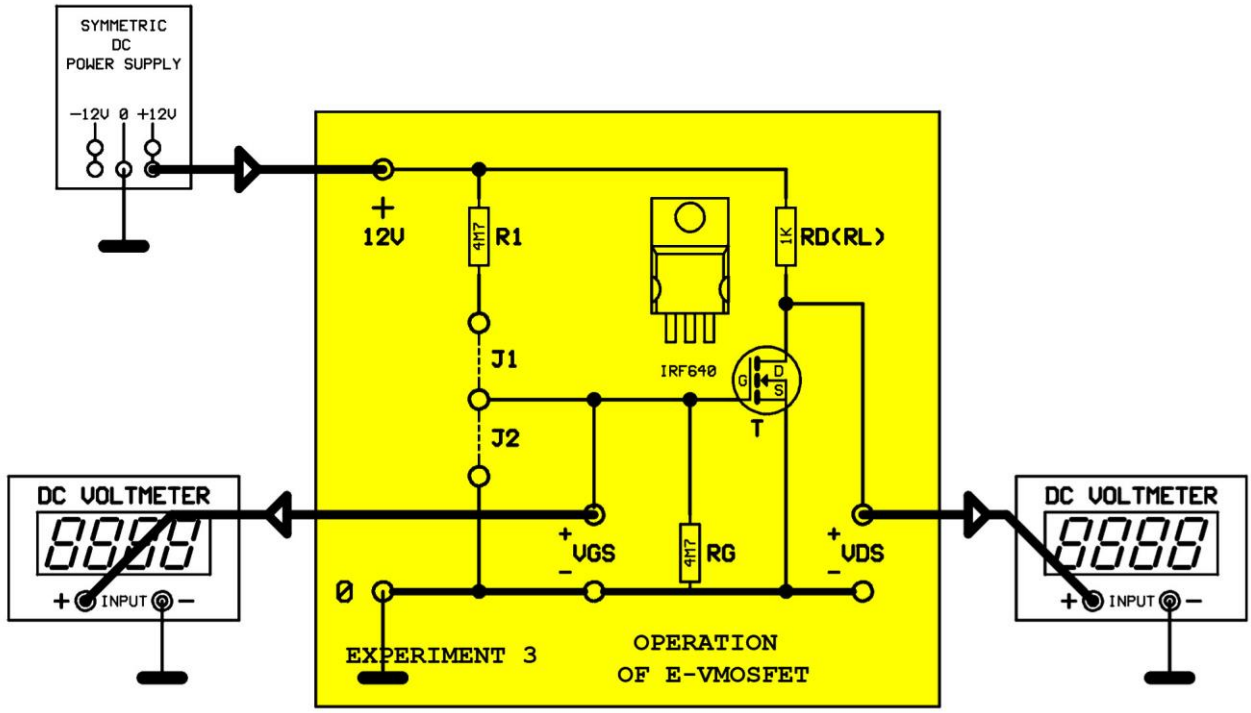

Figure 17.33

1-Short-circuit J2 points. Apply energy to the circuit. How much is the VDS voltage? Why?

VDS=*……Volt because ……..*
……..

2-Open the short-circuit on J2 points. Short-circuit J1 points. Measure the VGS and VDS voltages. In what situation (**cut off-transmission-saturation**) is E-VMOSFET at that moment?

VGS=*……..Volt,* ***VDS=****……mVolt. E-VMOSFET is at ……*

3-What is the meaning of **VDS=**2mV at saturation point?

VDS=*2mV at saturation point means that …….*
……..