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DIST- JANJGIR CHAMPA (C.G.)

Affiliated by Atal Bihari Vajpeyee Vishwavidyalaya Bilaspur
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DEPARTMENT OF PHYSICS
PROJECT REPORT
MOSFET

H.O.D. OF PHYSICS DEPARTMENT

Mr. R.P. UPADHYAY SIR

GUIDED BY

Mr. A.K. YADAV SIR


विभागाध्यक्ष
भौतिक शास्त्र विभाग
शास. नवीन महा. हसोद
जिला-जांजगीर चांपा (C.G.)


EXTERNAL

SUBMITTED BY

PREMLATA

DATE

MOSFET

OBJECT – Determination the V-I characteristics curve of MOSFET.

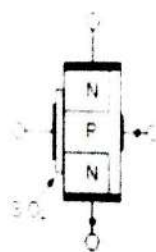
FEATURE –

- 1 Power supply 0-12 V
- 2 switch
- 3 Indicator light
- 4 digital voltmeter
- 5 miliameter (0-25 mA)
- 6 potentiometer (0-12 V)
- 7 No. of patch card.

THEORY – The most common type of insulated gate FET which is used in many diferent type of electronics circuits is called the metel oxide semiconductor field effect transistor (MOSFET)

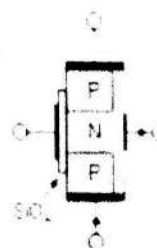
The MOSFET or IGFET(insulated gate field effect transistor) is a voltage controlled field effect transistor that deffers from a JFEET in that it has a metal oxide gate electrode which is electrical insulated from the main semiconductor n- channel or p- channel by a very thin layer of insulating material.

MOSFET are three terminal devices with a Gate, Drain and Source. And both p-channel (PMOS) and n-channel (NMOS) MOSFET are available.



N-channel MOSFET

Enhancement MOSFET
Channel construction



P-channel MOSFET

ACKNOWLEDGEMENT

I would like to express my special thanks of my gratitude to my professor **Mr.R.P.UPADHYAY and A.K.YADAV**, who gave me the golden oppertunity to do this wonderful project of **MOSFET**.

Who also helped me in completing my project. i came to know about so many things i an really thankful to them.

Secondly I would also like to thanks my parents and my friends (PREMLATA, SHIVA, BHUNESHWAR, and NANDKUMAR) who helped me a lote in finalizing this project within the limited time periode.

DATE

PREMLATA BARMAN
M.Sc Physics 4th Sem.

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MOSFET

OBJECT – Determination the MOSFET of V-I characteristics curve.

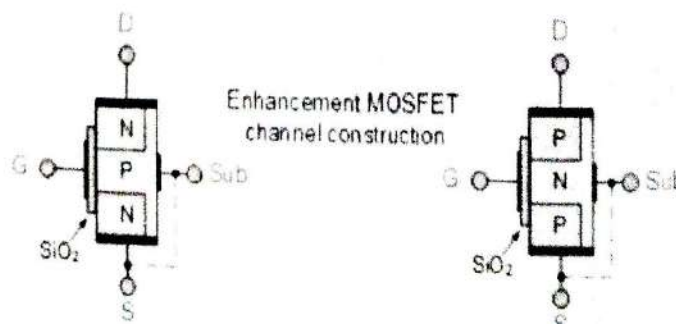
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THEORY – The most common type of insulated gate FET which is used in many diferent type of electronics circuits is called the metel oxide semiconductor field effect transistor (MOSFET)

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MOSFET are three terminal devices with a Gate, Drain and Source. And both p-channel (PMOS) and n-channel (NMOS) MOSFET are available.



There are two types of MOSFET

1. Depletion type (D-type)
2. Enhancement type (E-type)

Depletion type- the transistor requires the Gate source voltage (V_{GS}) to switch the device 'OFF' the depletion mode MOSFET is equivalent to a "Normally closed" switch the symbol is represented in figure 2



Figure (2) D-type (Normally on)

Enhancement Type- The transistor requires a Gate source voltage (V_{GS}) to switch the device "ON" the enhancement mode MOSFET is equivalent to a "Normally open" switch

The symbol is represented in figure (3)

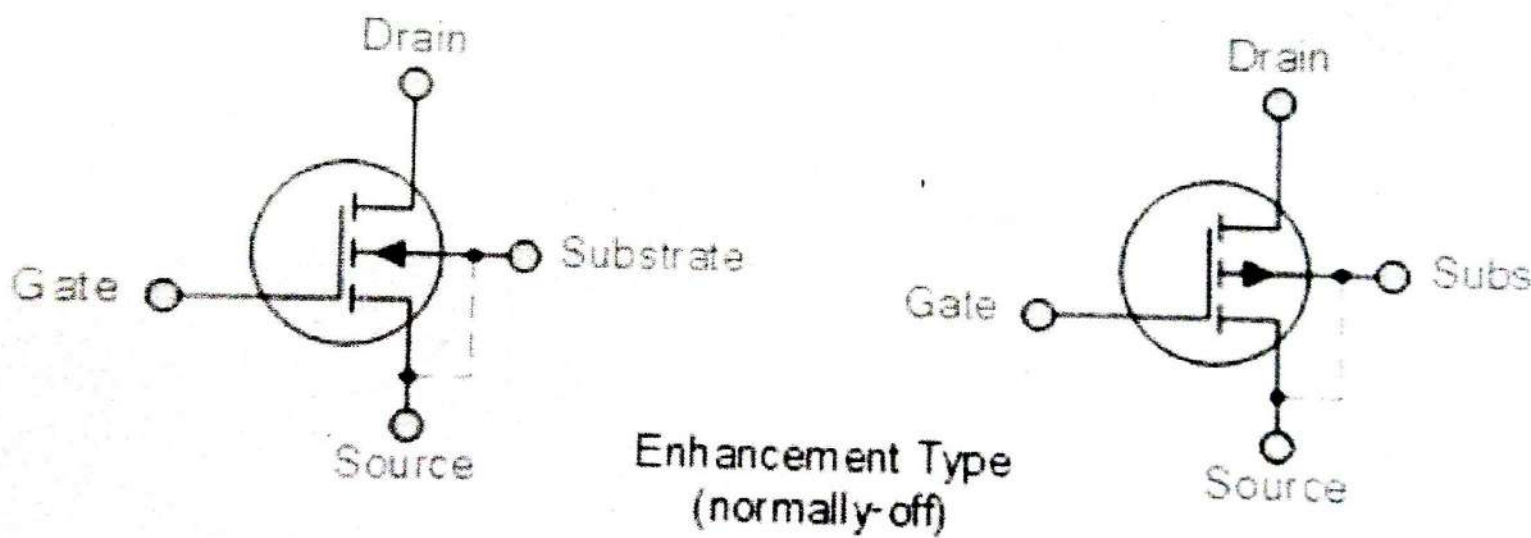


Figure (3)- E-type (Normally Off)

re – circuit diagram for characteristic curve of depletion type

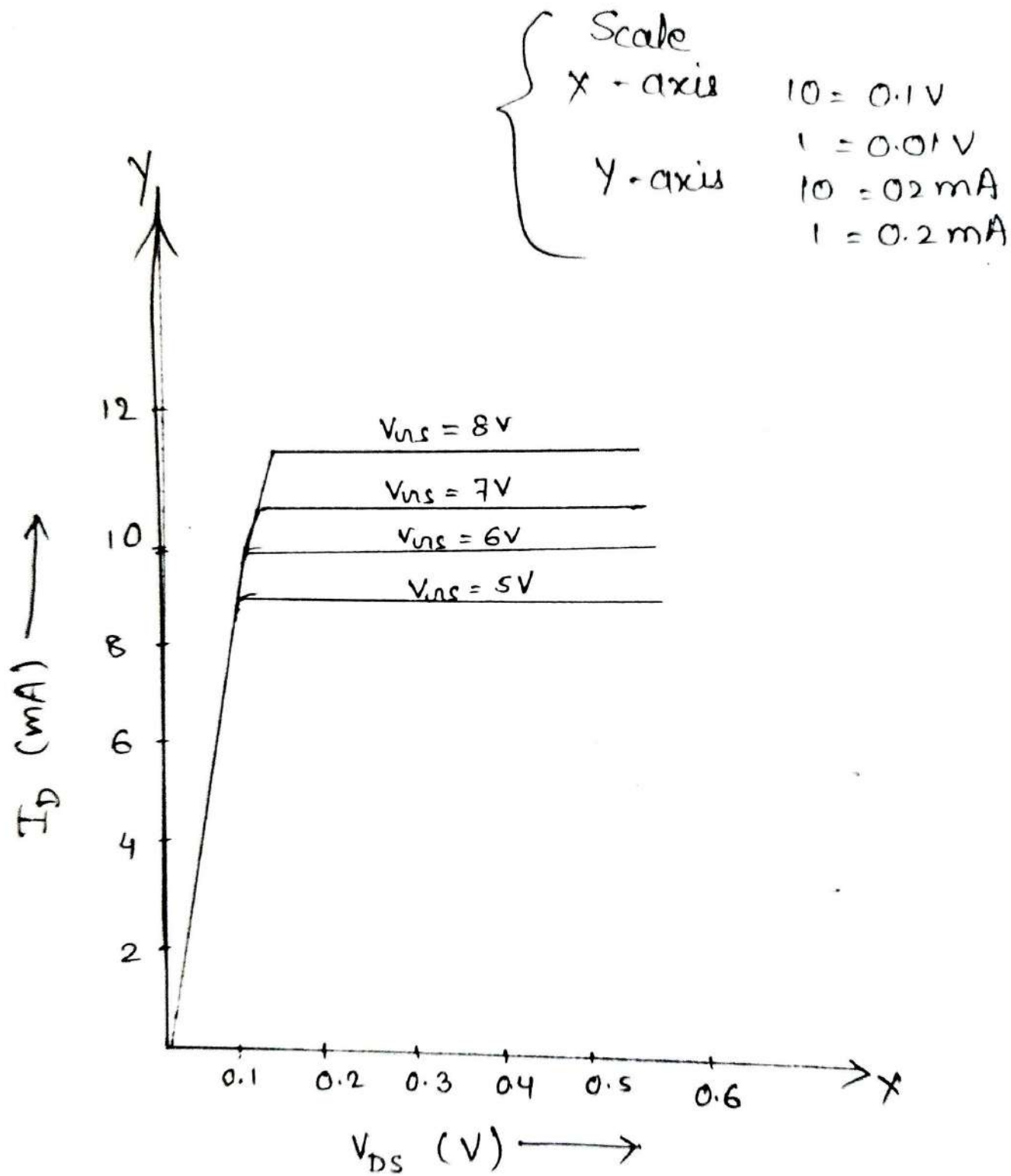
MOSFET in N-channel

PROCEDURE-

1. Connect the power supply.
2. Connect all patch card as show in circuit diagram.
3. V_{GS} fixed at constant value .. $5V$.. now increases the value of V_{DS} (V_2) by potentiometer-2 (B_2) and read the value of I_D corresponding to V_{DS} in observation table.
4. Again V_{GS} fixed at another value .. $6V$ and increases the value of V_{DS} by potentiometer-2 (B_2) and read the value of I_D corresponding to V_{DS} in observation table.
5. And repeat this process step by step.
6. Now draw the characteristics curve between V_{DS} (in V) and I_D (in mA) of **MOSFET**

OBSERVATION TABLE

$V_{GS} = 0.1$ VOLT		$V_{GS} = 0.2$ VOLT		$V_{GS} = 0.3$ VOLT		$V_{GS} = 0.4$ VOLT	
V_{DS} (V)	I_D (mA)	V_{DS} (V)	I_D (mA)	V_{DS} (V)	I_D (mA)	V_{DS} (V)	I_D (mA)
0	0	0	0	0	0	0	0
0.02	5.5	0.02	6.5	0.02	6.5	0.02	6.5
0.05	6.5	0.05	9.5	0.05	9.5	0.05	8.5
0.07	8.5	0.07	10.0	0.07	10.5	0.07	11.5



graph : output characteristics for MOSFET

RESULT – We obtain output characteristic as show in graph.

ADVANTAGE-

1. MOSFET provide greater efficiency while operating at lower voltage.
2. Absence of gate current result in high input impedance producing high switching speed.
3. They operate at lower power and draw no current.

DISADVANTAGE –

1. The thin oxide layer make the MOSFET vulnerable to permanent damage when evoked by electrostatics charges.
2. Overload voltage make it unstable

USE- It is the semiconductor dives which is widely used for switching and amplifying electronic signal in the electronic devices.

PRECAUTION-

1. Check the apparatus before start our experiment.
2. Carefully doing one by one procedure.
3. Carefully supply the current otherwise apparatus will be defected.
4. Carefully connect the patch card otherwise apparatus may be effected.
5. Carefully observe result in the observation table.

BOOK REFERENCE .

- | | |
|--|--------------------------|
| 1. The Social Contract | John Rawls |
| 2. Foundations of Economic Liberty | Capitalism and Democracy |
| 3. The Moral Basis of Economic Liberty | John Rawls |
| 4. The Moral Basis of Economic Liberty | John Rawls |
| 5. The Moral Basis of Economic Liberty | John Rawls |

BOOK REFERENCE -

1. B.Sc final year : R.P.Goyal
2. Handbook of Electronics : Gupta Kumar SHARMA
3. Principle of Electronics : V.K. Mehta
4. Semiconductor device : S.M.SZE
5. Wikipedia of MOSFET : google