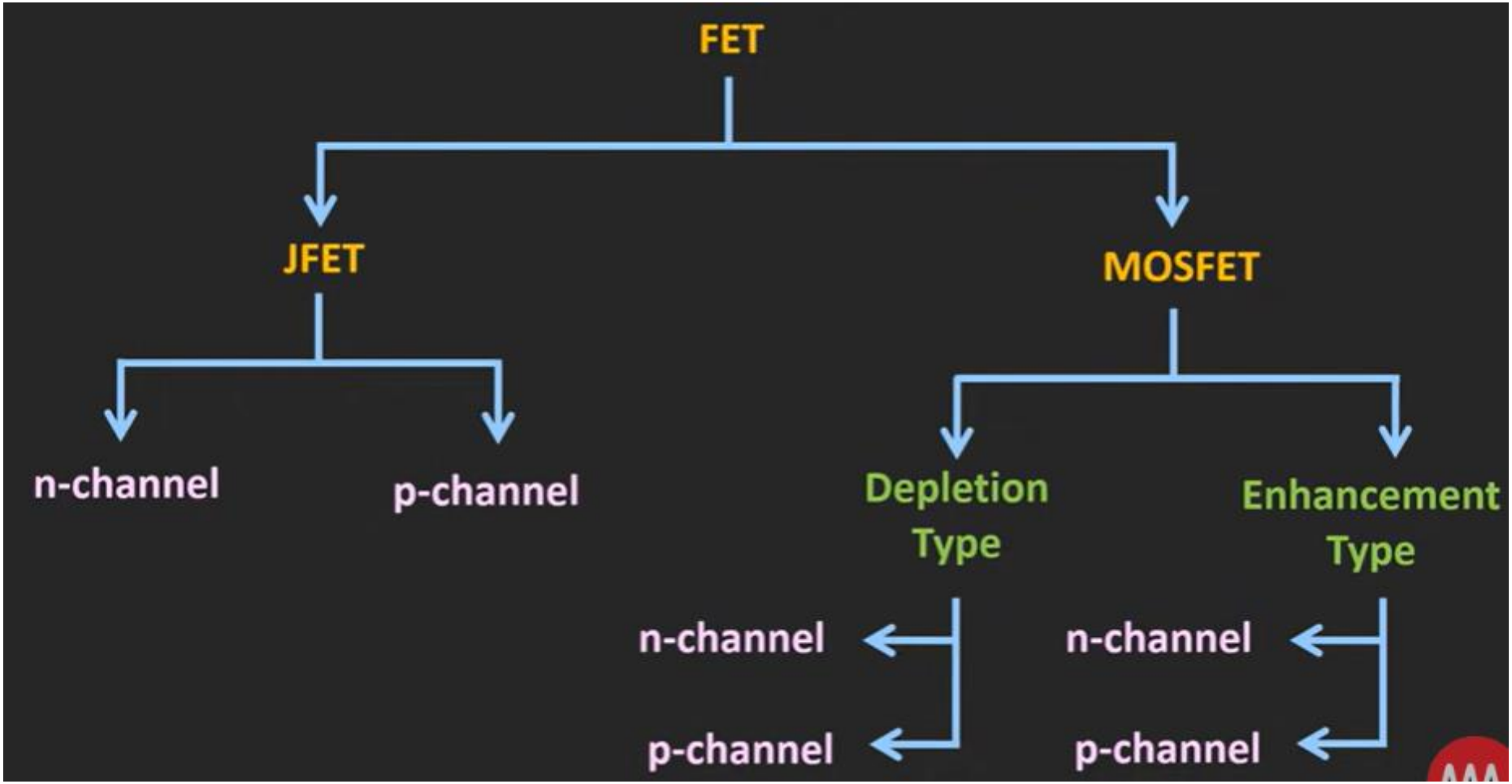
Electronic Devices

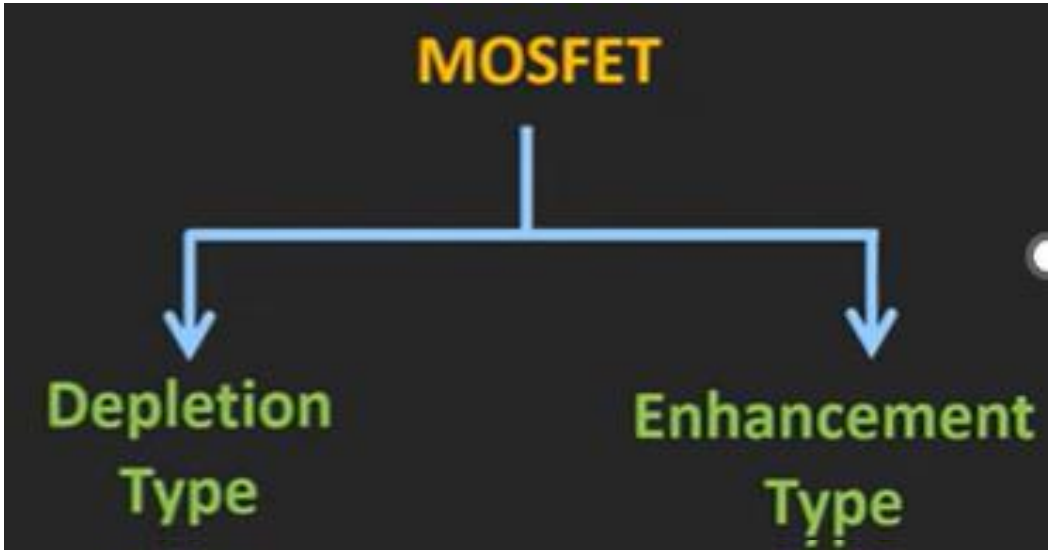
Final Term
Lecture - 04

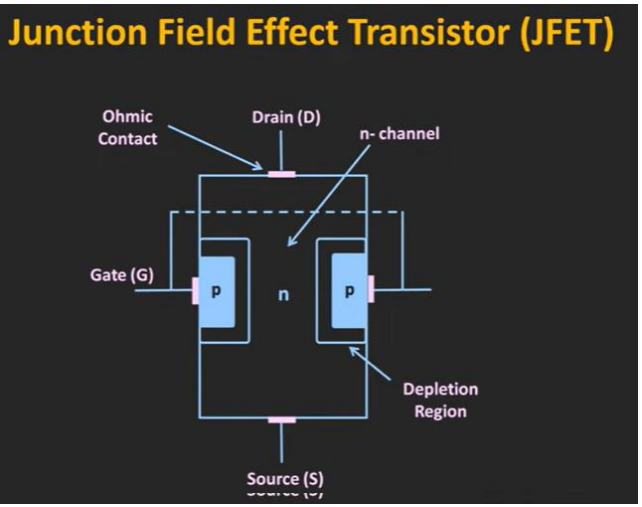
Reference book:

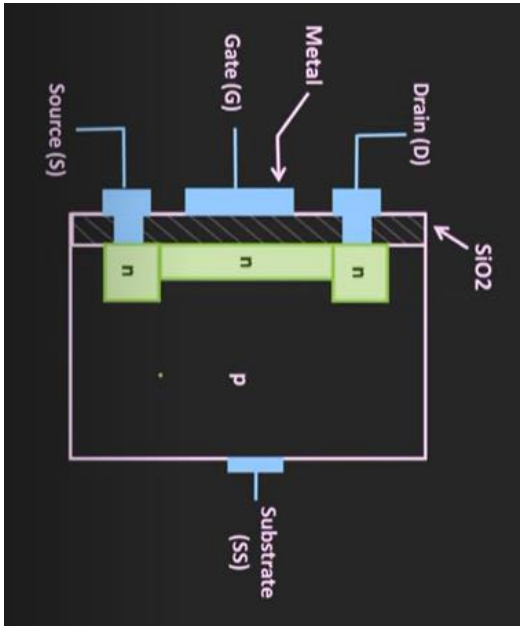
Electronic Devices and Circuit Theory (Chapter-6)

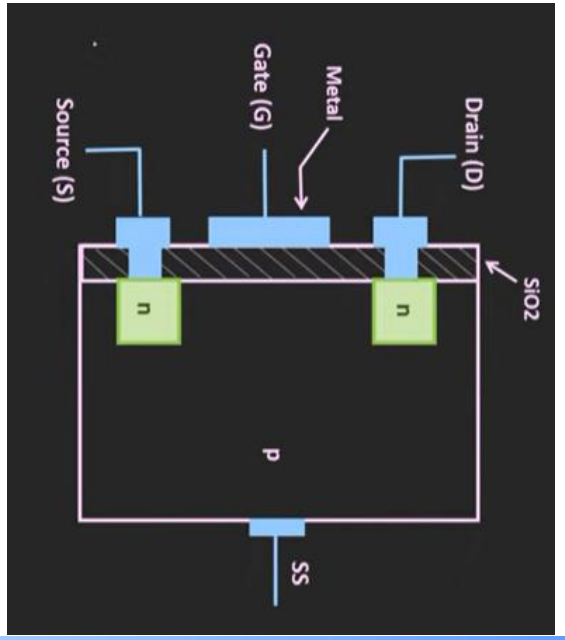
Robert L. Boylestad and L. Nashelsky , (11th Edition)


FET
JFET
MOSFET
n-channel
p-channel
Depletion Type
Enhancement Type
n-channel
p-channel
n-channel
p-channel

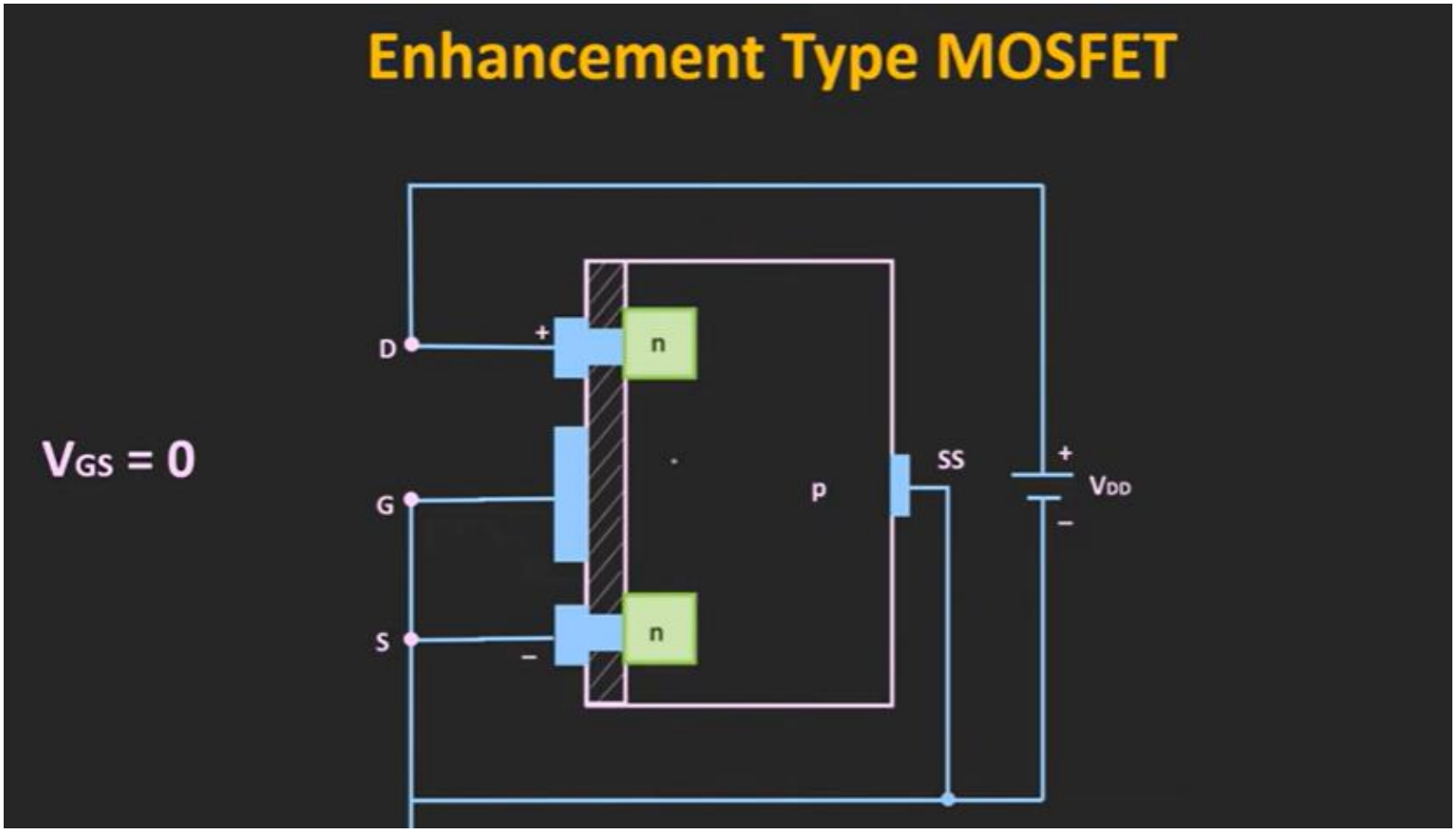

MOSFET
Depletion Type
Enhancement Type

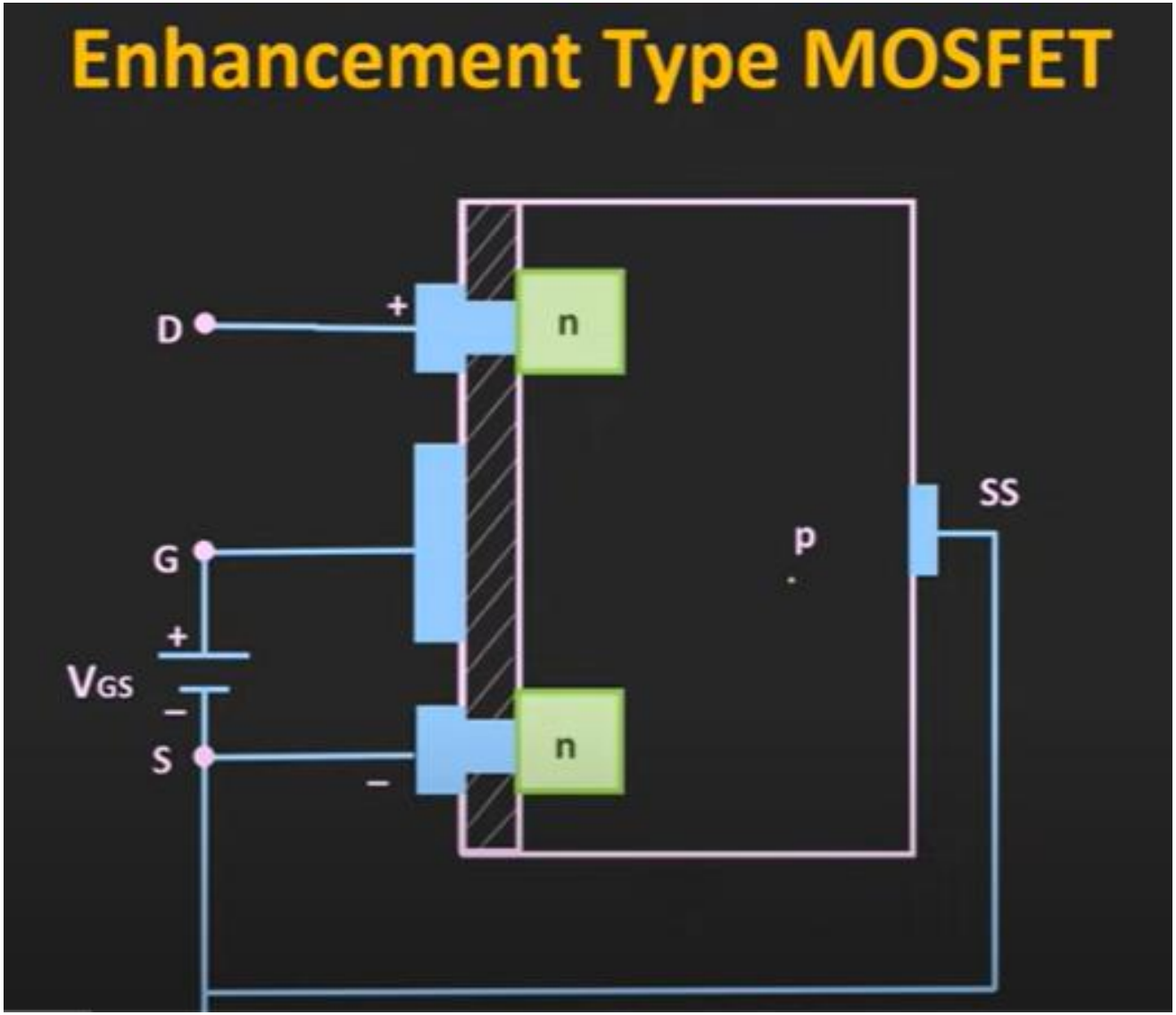

Junction Field Effect Transistor (JFET)
Ohmic Contact
Drain (D)
n- channel
Gate (G)
p
n
p
Depletion Region
Source (S)

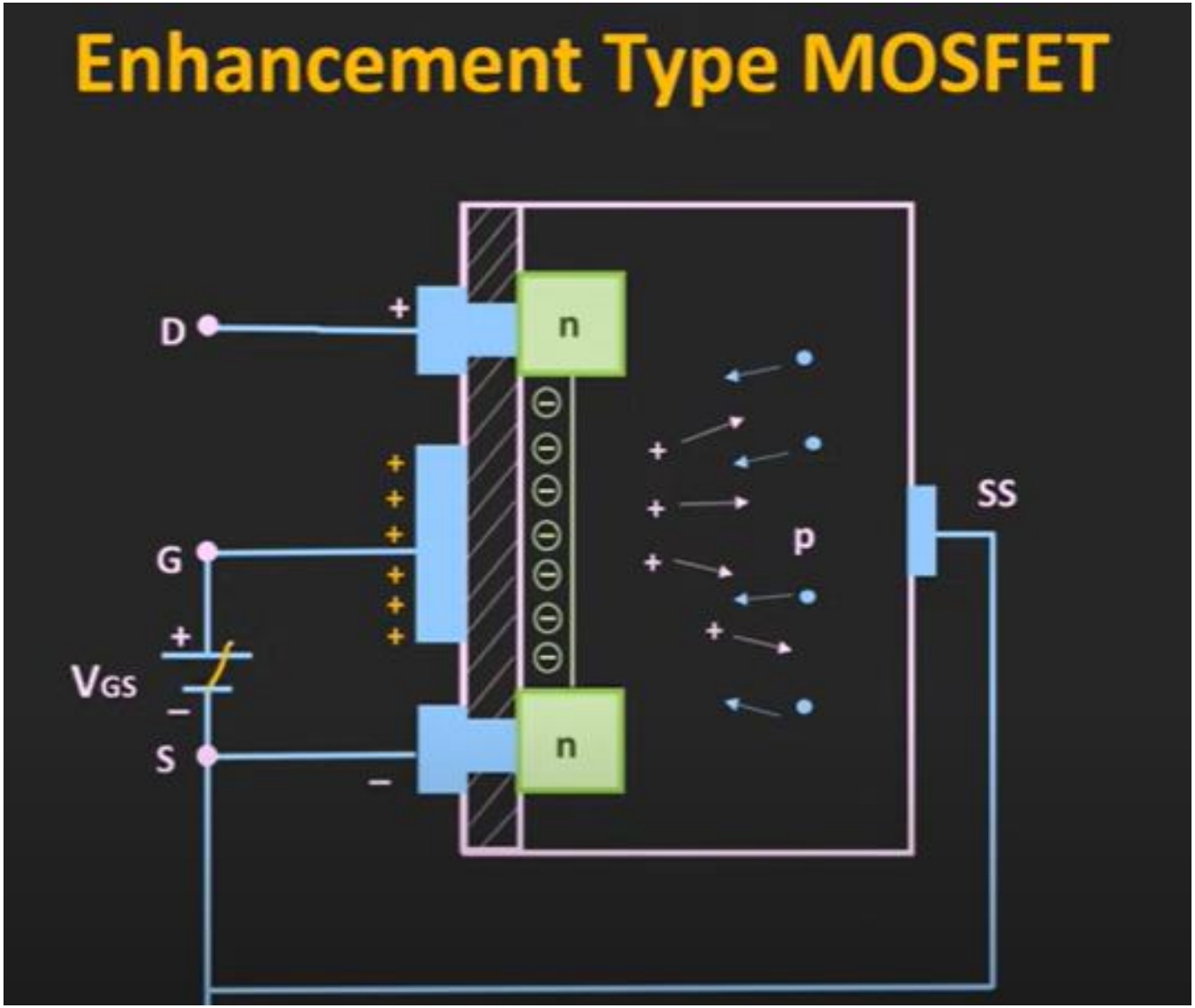

Source (S)
Gate (G)
Metal
Drain (D)
SiO2
n
n
n
p
Substrate (SS)


Source (S)
Gate (G)
Metal
Drain (D)
SiO2
n
n
p
SS

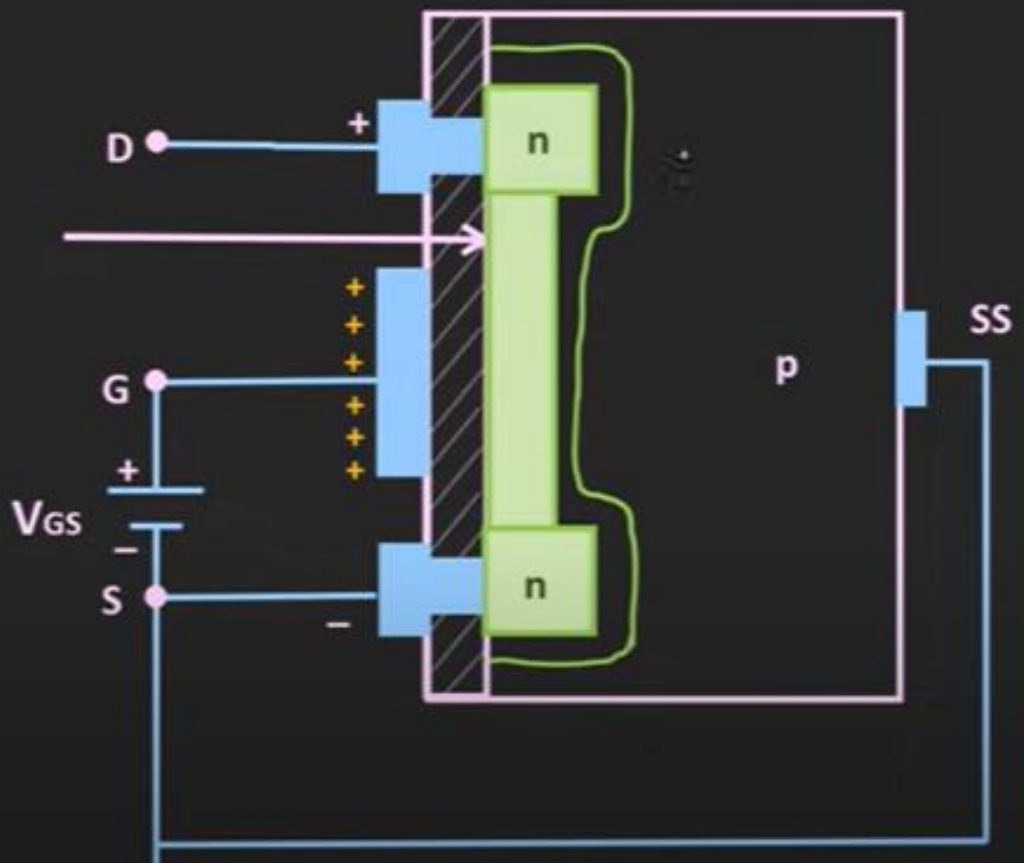
Enhancement Type MOSFET



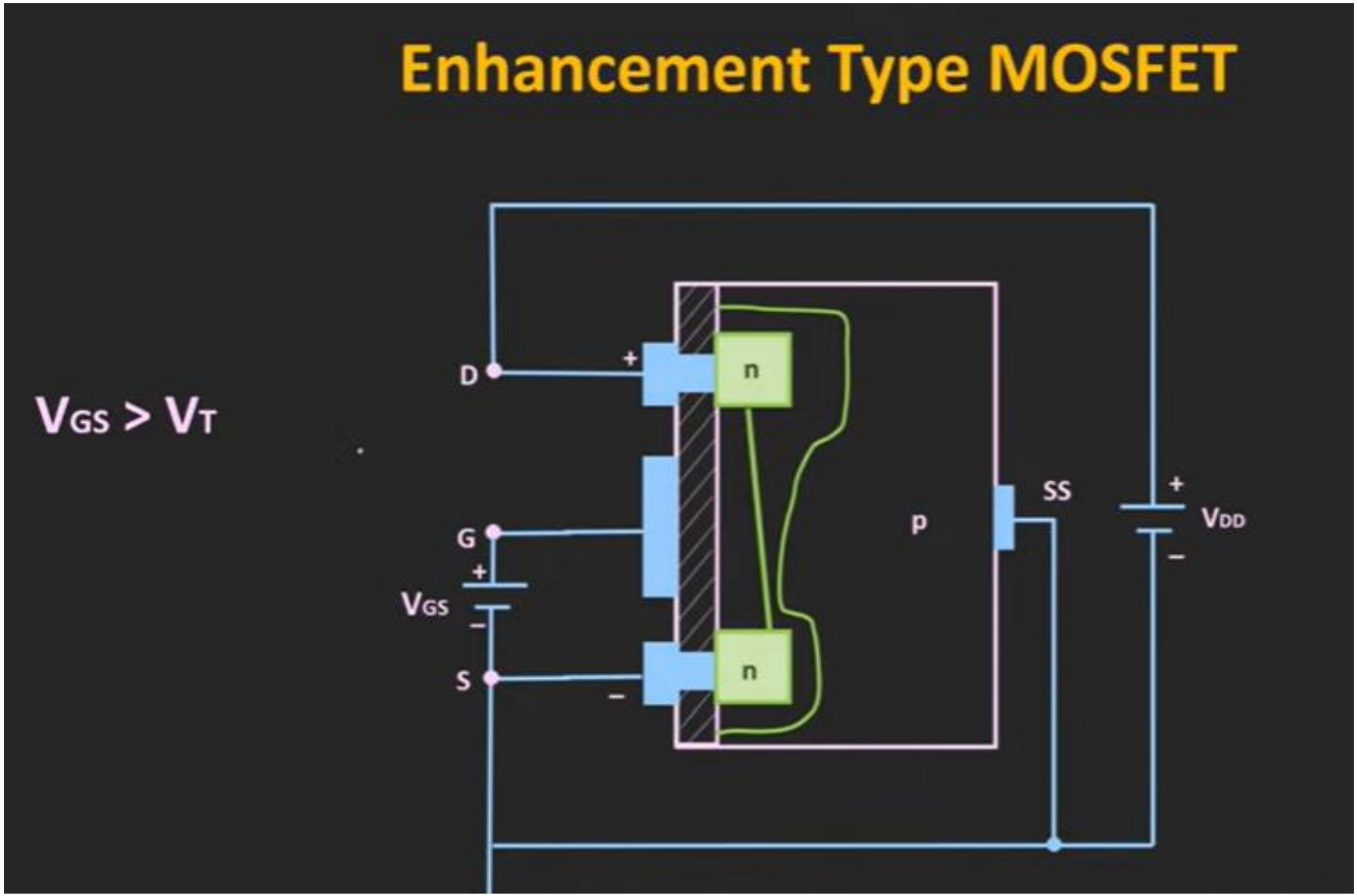

Enhancement Type MOSFET
D
+
n
G
+
VGS
–
S
–
n
p
SS


Enhancement Type MOSFET
D
G
S
SS
n
n
p
VGS

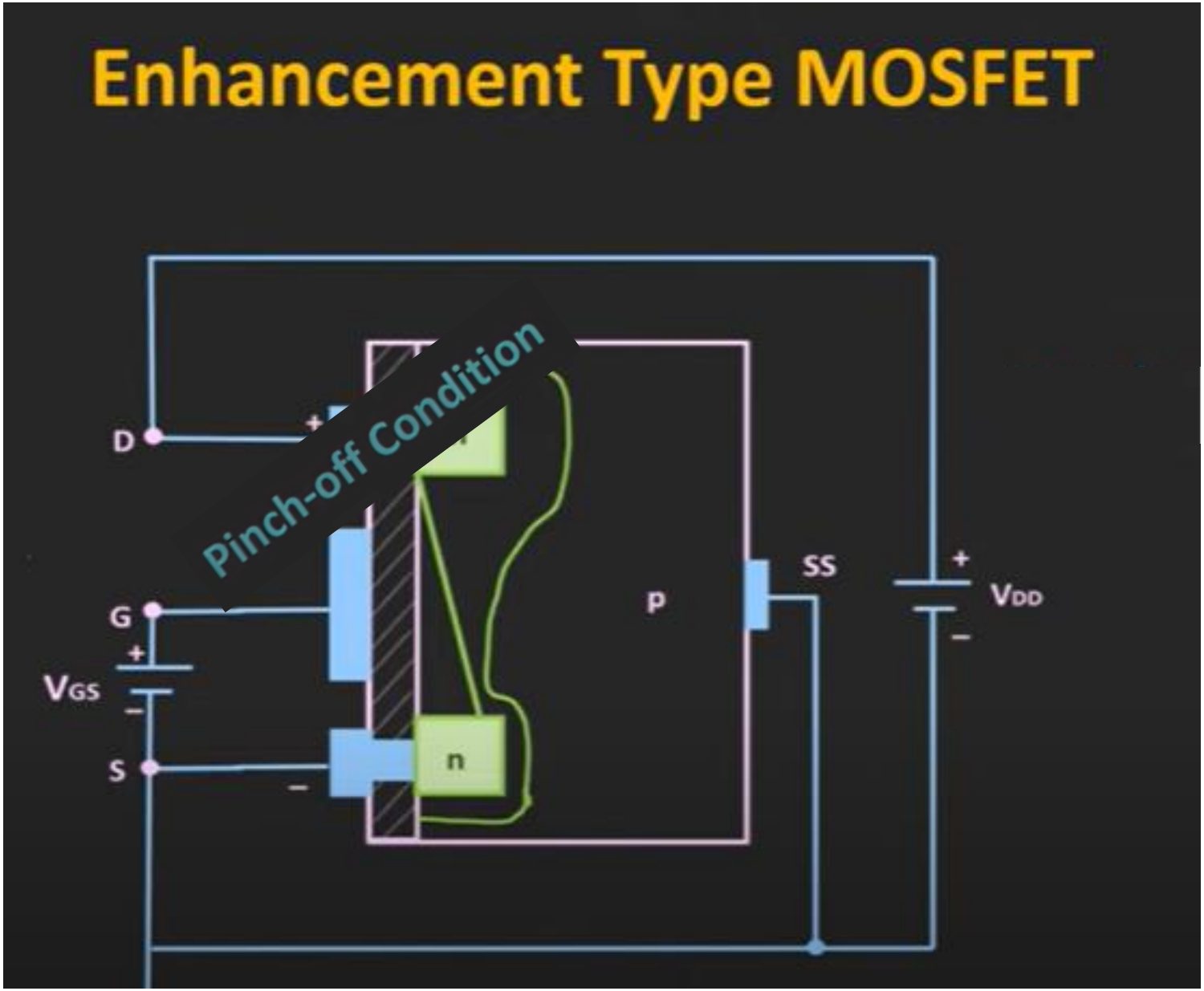
Enhancement Type MOSFET



Enhancement Type MOSFET

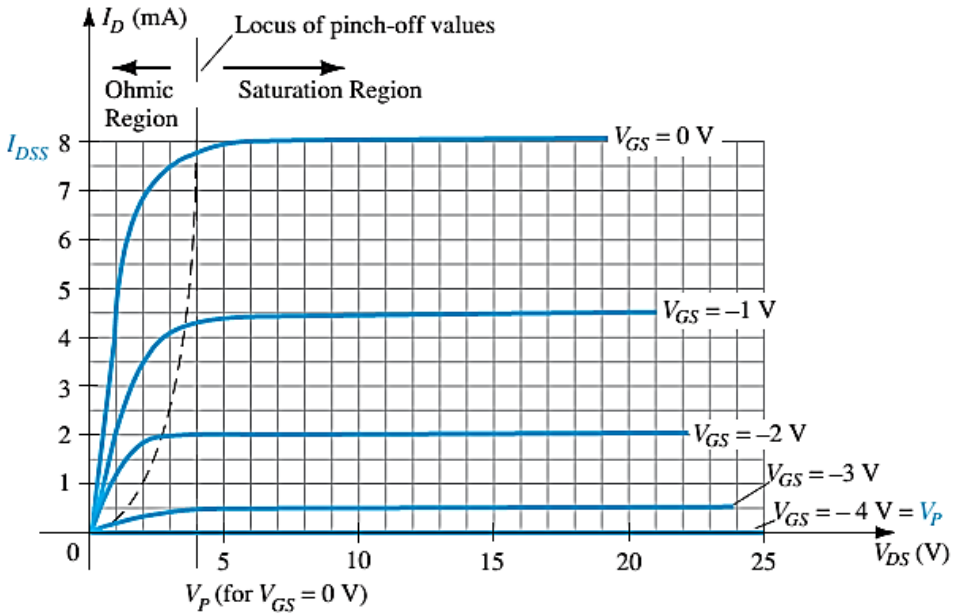


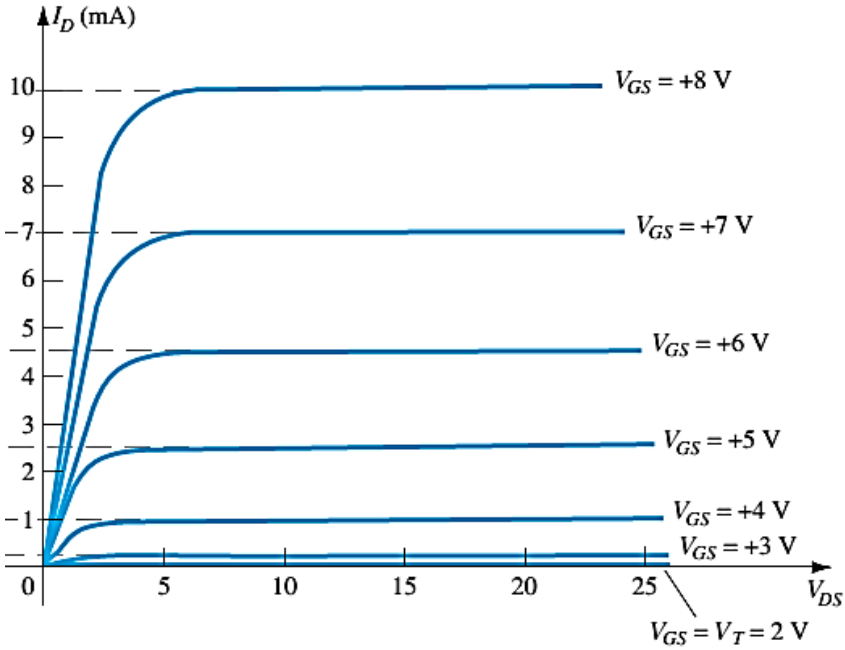
Enhancement Type MOSFET



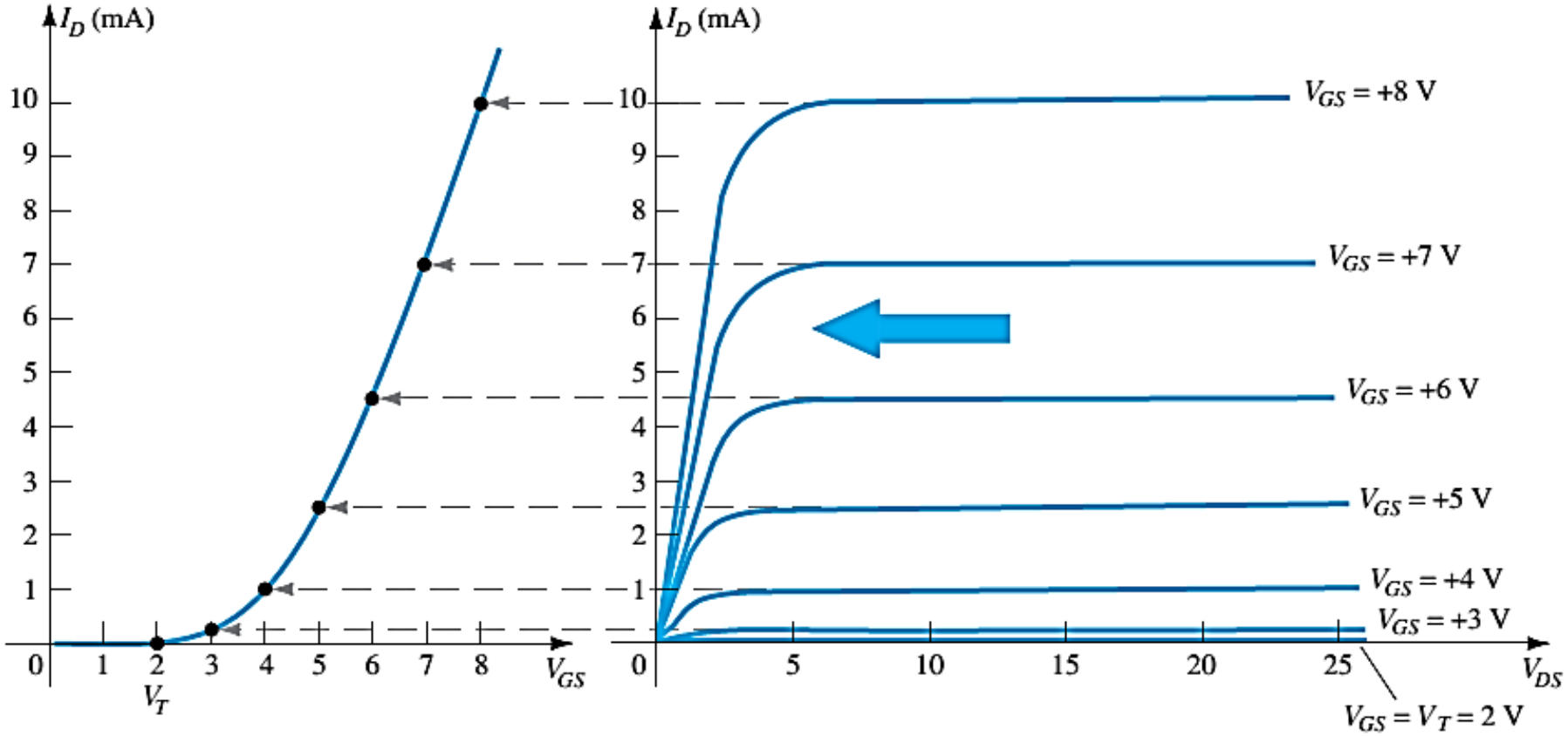
Junction Field Effect Transistor (JFET)

MOSFET



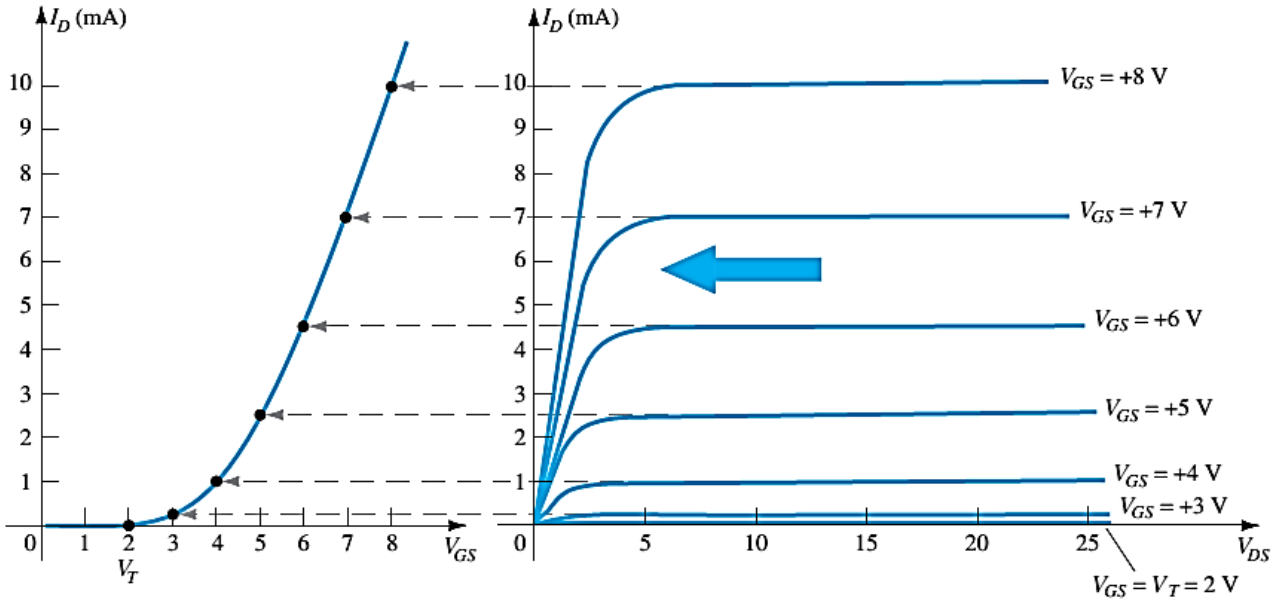


Transfer Curve



Transfer Curve

- ***V_{GS} is always positive.***
- As ***V_{GS} increases***, ***I_D increases.***
- But if ***V_{GS} is kept constant*** and ***V_{DS} is increased***, then ***I_D saturates (I_{DSS}).***
- The saturation level, ***V_{DSsat} is reached.***



End of Lecture-4