



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai



DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

19EE504 - SPECIAL ELECTRICAL MACHINES

UNIT – 3

STEPPER MOTOR

DRIVE CIRCUITS OF STEPPER MOTOR



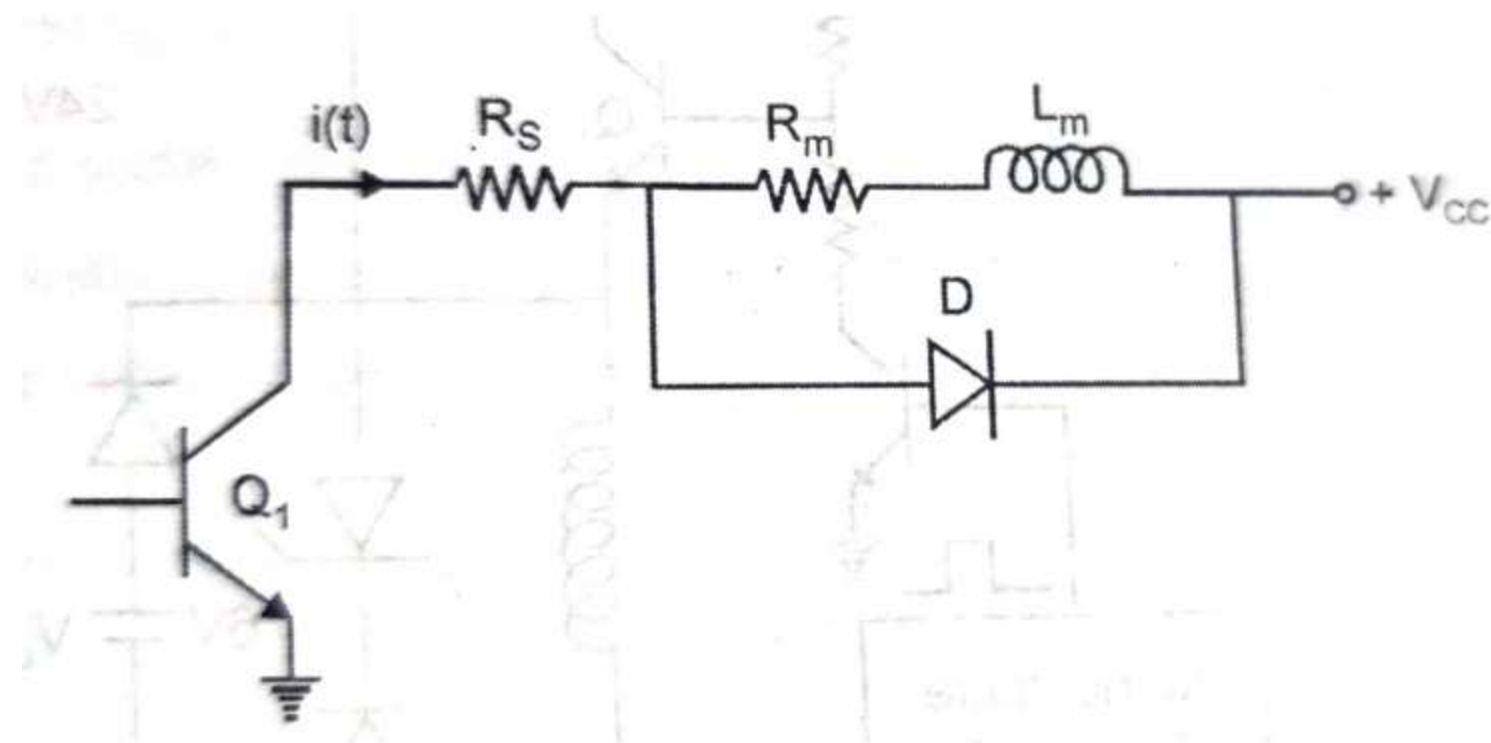
CONTENTS

- Types of power driver circuits
- Resistance drive (L/R Drive)
- Dual Voltage Driver or Bi level driver
- Chopper Drive
- Applications of stepper motor



Resistance Drive (L/R Drive)

- Here the initial slope of the current waveform is made higher by adding external resistance in each winding and applying a higher voltage proportionally

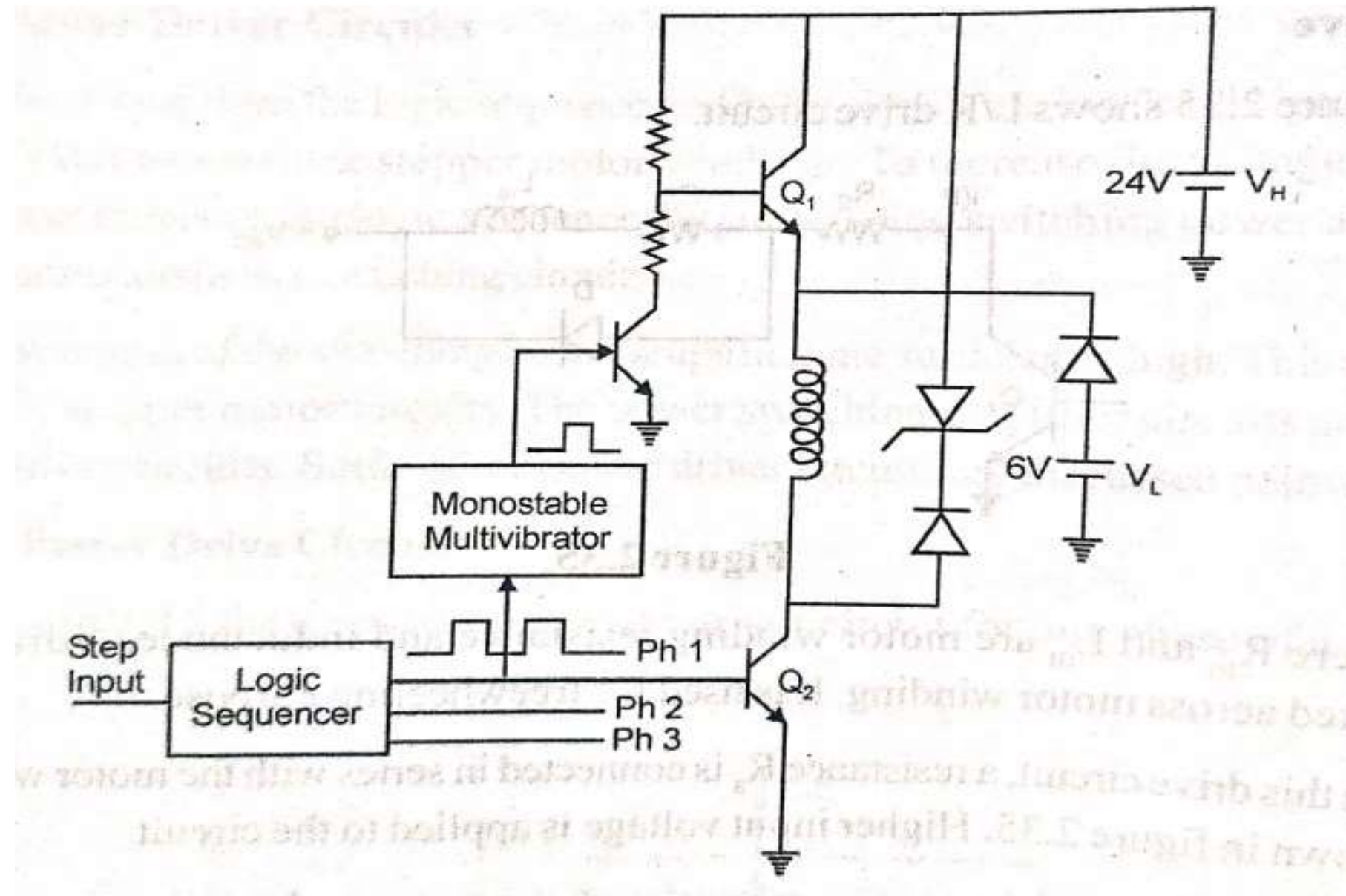




Dual Voltage Drive

- To reduce the power distribution in the driver and increase the performance of a stepping motor , a dual driver is used.
- When a step command pulse is given to the sequencer , a high level signal will be put out from one of the output terminal to excite the phase winding.
- On this signal both 1 and 2 are turned ON and higher voltage is applied on the winding.
- The diode is now reverse biased to isolate the lower voltage supply.

Dual Voltage Drive





Dual Voltage Drive

- The current build up quickly due to higher voltage.
- The time constant of monostable multivibrator is selected so that transistor 1 is turned off when the winding current exceeds the rated current by a little.
- After the higher voltage source is cut off the diode is forward biased and the winding current is supplied from lower voltage supply.

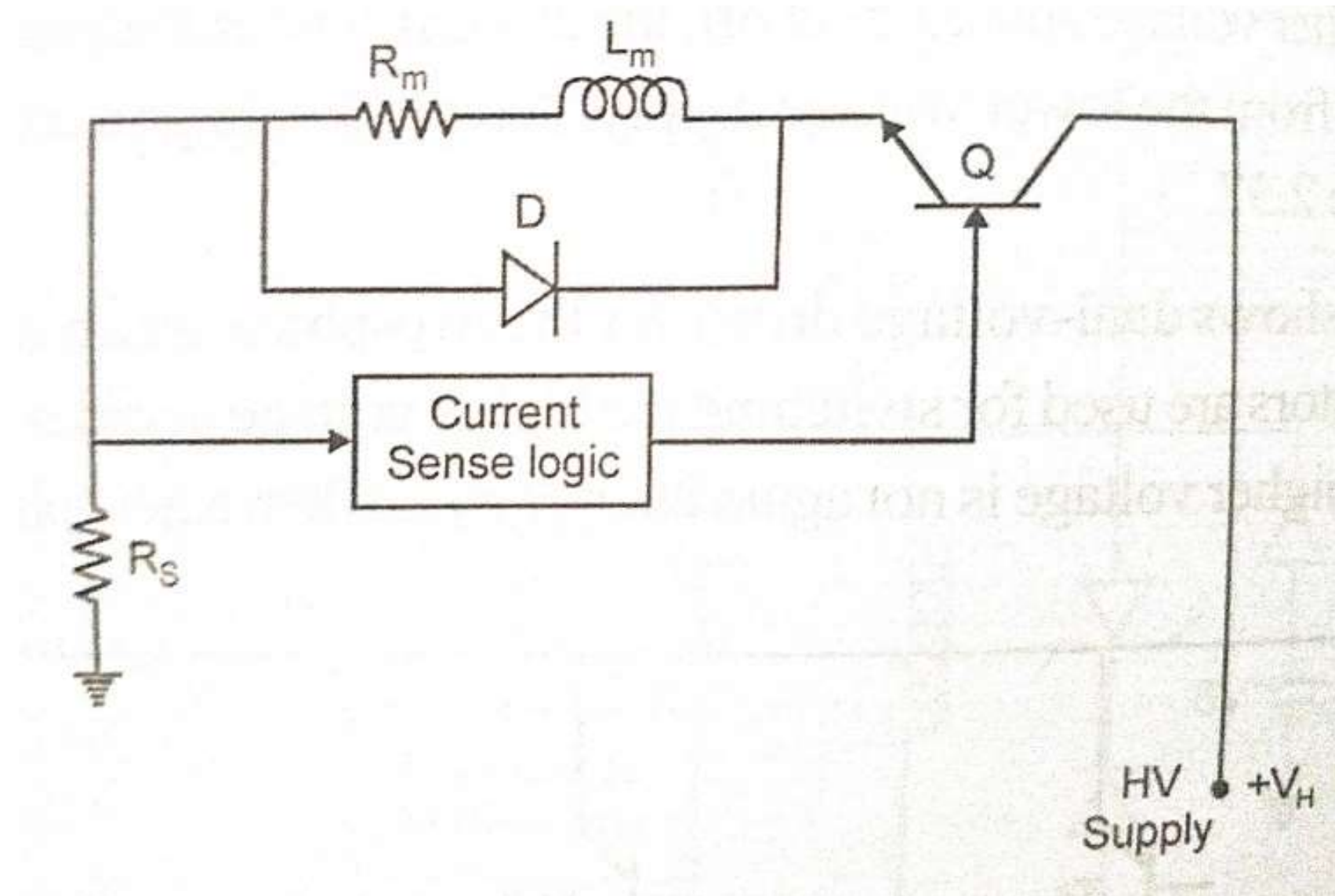


Chopper Drive

- Higher voltage 5 to 10 times the related value is applied to the phase winding , and the current is allowed to raise fast.
- As soon as the current reaches about 2 to 5 % above the rated current, the voltage is cut off allowing the current to decrease exponentially.
- As the current reaches some 2 to 5 % below the rated value , the voltage is applied again.
- This process is repeated 5 to 6 times within the ON period before the phase is switched off.
- During this period the current oscillates above the rated value .



Chopper Drive



Basic Bipolar Drive

