



# SUPPLYING POWER

AC POWER

DC POWER



# AC POWER

THREE PHASE

SINGLE PHASE



# AC POWER

THREE PHASE

480V

208V



# AC POWER

480V

HIGHER VOLTAGE, LOWER CURRENT

LOWER CURRENT, LOWER VOLTAGE DROP IN LINES



# AC POWER

480V

CAN SUPPLY SINGLE PHASE 277V



# AC POWER

208V

CAN SUPPLY SINGLE PHASE 120V



# AC POWER

TRANSFORMERS USED EXCLUSIVELY IN AC

COILS OF WIRE CONNECTED BY A FERROUS CORE



# DC POWER

AS LOW AS 3.3V

CAN BE UP TO HUNDREDS OF VOLTS

TYPICAL 5, 12 AND 24V





# DC POWER

LINEAR SUPPLIES

LOWER EFFICIENCY

SMOOTH, STABLE OUTPUT



# DC POWER

INCOMING AC POWER

120V OR 230V, MANY DEVICES SWITCHABLE

SWITCH TOGGLES BETWEEN THE CENTER TAP AND END OF PRIMARY COIL



# DC POWER

BRIDGE RECTIFIER TURNS AC INTO CHOPPY DC

TWO DIODES DROP A LITTLE VOLTAGE



# DC POWER

CAPACITOR SMOOTHS THE VOLTAGE, SMOOTHING CAP

SOMETIMES A REGULATOR FURTHER SLICES A TINY BIT OFF THE TOP



# DC POWER

FINAL SMALL CAPACITOR FOR VERY FAST MOMENTARY DRAWS

- HEAT CAN BE DEVELOPED BY THE REGULATOR



# DC POWER

SWITCHING REGULATOR

VERY EFFICIENT, WASTES NOTHING IF NO LOAD

NOT SMOOTH AT ALL



# DC POWER

FIRST, THE AC IS CHANGED TO DC

TRANSFORMER HAPPENS LATER



# DC POWER

THE LOAD IS MONITORED

A TRANSISTOR IS SWITCHED ON AND OFF, WITH A DUTY CYCLE BASED ON  
DEMAND





# DC POWER

THE SWITCHED CURRENT IS PASSED THROUGH A TRANSFORMER, STEPPING IT DOWN

OUTPUT IS A SMALLER, PULSED DC VOLTAGE



# DC POWER

HIGHER LOAD DEMAND = LONGER PULSE DUTY CYCLE

THE NAME 'SWITCHING POWER SUPPLY' REFERS TO ITS BEHAVIOR