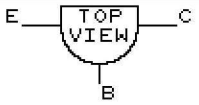
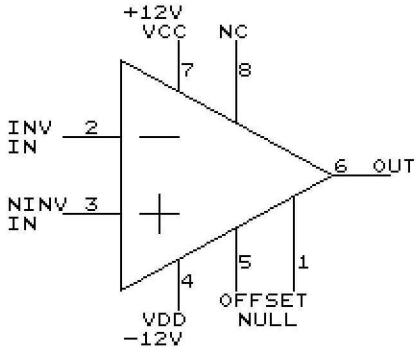
FILE= ICPINS8.DRG HW.CSE.IIT.KGP 26-AUG-02

MAKE NO MARK SHEET— 8

# TRANSISTOR CHARACTERISTICS




| DEVICE | TYPE | P TOT W | V CBO V | V CEO V | V EBO V | I C mA | HFE | V SAT V | F T MHZ | I CBO µA |
|---|---|---|---|---|---|---|---|---|---|---|
| BC547 | NPN | 0.5 | 50 | 45 | 6 | 200 | 100 | 0.3 | 300 | .015 |
| BC557 | PNP | 0.3 | 50 | 45 | 6 | 200 | 100 | 0.3 | 75 | .015 |
| BEL187 | NPN | 0.6 | 25 | 15 | 5 | 1000 | 70 | 0.5 | 270 | 10 |
| BEL188 | PNP | 0.6 | 25 | 15 | 5 | 1000 | 70 | 0.5 | 250 | 10 |
| BF393 | NPN | | 300 | 300 | | 500 | | | | |
| BC639 | NPN | | 80 | 110 | 5 | 150 | | | | |

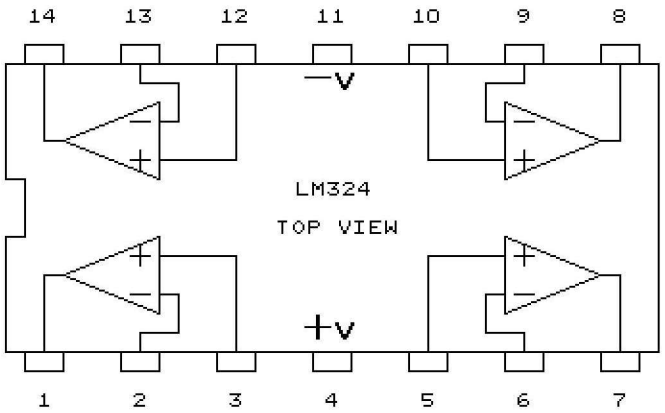



## LM741 OPERATIONAL AMPLIFIER CHARACTERISTICS

| | |
|---|---|
| VCC,VDD MAX | +18V,−18V |
| OPEN LOOP GAIN | 25000 MIN |
| CMRR | 90 DB |
| INPUT VOLT RANGE | VCC−2V, VDD+2V |
| OUTPUT VOLT MAX | VCC−2V, VDD+2V |
| OUTPUT CURRENT | 10 mA MAX |
| BANDWIDTH | 1.5 MHZ |
| SLEW RATE | 0.5V / µSEC |
| SUPPLY CURRENT | 2.8 mA MAX |
| INPUT BIAS CURRENT | 500 nA MAX |

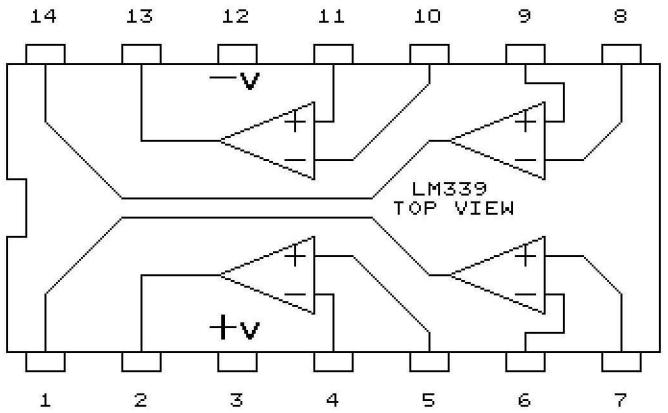
## LM324

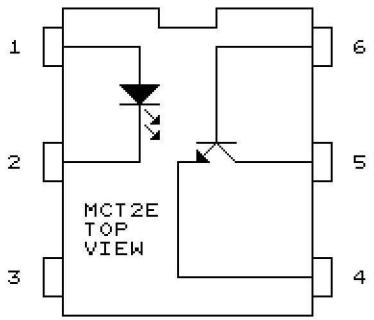
QUAD OP-AMP
SPECS = LM741




## LM339

QUAD COMPARATOR
OPEN COLLECTOR OUTPUT
+V MAX +18V
−V MAX −18V




## MCT2E

OPTO-COUPLER