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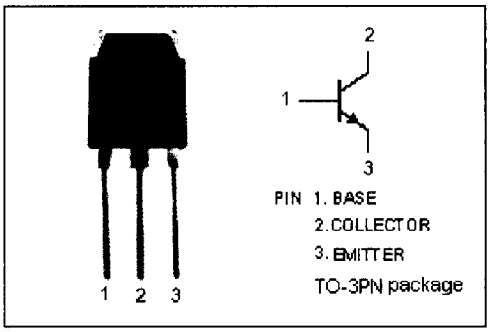
# Silicon NPN Power Transistor — D209L

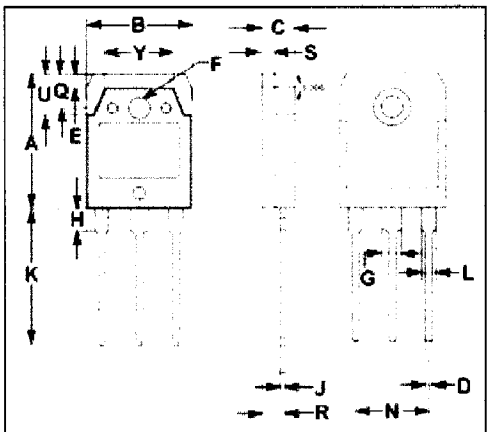
## DESCRIPTION

- High Collector-Emitter Breakdown Voltage-
  : $V_{(BR)CEO}$= 400V(Min)
- High Switching Speed
- High Reliability




## APPLICATIONS

- Switching regulators
- Ultrasonic generators
- High frequency inverters
- General purpose power amplifiers




| DIM | mm MIN | mm MAX |
|---|---|---|
| A | 19.90 | 20.10 |
| B | 15.38 | 15.42 |
| C | 4.75 | 4.85 |
| D | 0.90 | 1.10 |
| E | 1.90 | 2.10 |
| F | 3.40 | 3.60 |
| G | 2.98 | 3.02 |
| H | 3.20 | 3.40 |
| J | 0.595 | 0.605 |
| K | 19.95 | 20.25 |
| L | 1.98 | 2.02 |
| N | 10.89 | 10.91 |
| Q | 4.95 | 5.05 |
| R | 3.35 | 3.45 |
| S | 1.995 | 2.005 |
| U | 5.90 | 6.10 |
| Y | 9.90 | 10.10 |

## ABSOLUTE MAXIMUM RATINGS($T_a$=25℃)

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 700 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 400 | V |
| $V_{EBO}$ | Emitter-Base voltage | 9 | V |
| $I_C$ | Collector Current-Continuous | 12 | A |
| $P_C$ | Collector Power Dissipation @ $T_C$=25℃ | 100 | W |
| $T_J$ | Junction Temperature | 150 | ℃ |
| $T_{stg}$ | Storage Temperature Range | -55~150 | ℃ |

## ELECTRICAL CHARACTERISTICS

**$T_C$=25℃ unless otherwise specified**

| SYMBOL | PARAMETER | CONDITIONS | MIN | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | $I_C$= 10mA ; $I_B$= 0 | 400 | | | V |
| $V_{(BR)CBO}$ | Collector-Base Breakdown Voltage | $I_C$= 1mA ; $I_E$= 0 | 700 | | | V |
| $I_{EBO}$ | Emitter Cutoff Current | $V_{EB}$= 7V; $I_C$=0 | | | 0.01 | mA |
| $h_{FE1}$ | DC Current Gain | $I_C$=5A ; $V_{CE}$= 5V | 8 | | 40 | |
| $h_{FE2}$ | DC Current Gain | $I_C$=8A ; $V_{CE}$= 5V | 6 | | 30 | |
| $V_{CE(sat)}$ | Collector-Emitter Saturation Voltage | $I_C$= 5A; $I_B$= 1A | | | 1.0 | V |
| $V_{BE(sat)}$ | Base-Emitter Saturation Voltage | $I_C$= 8A; $I_B$= 1.6A | | | 1.2 | V |
| $f_T$ | Current Gain Bandwidth Product | $V_{CE}$=10V,$I_C$=100mA,f=1MHZ | 5 | | | MHZ |

Switching times

| | | | | | | |
|---|---|---|---|---|---|---|
| $t_s$ | Storage Time | $I_C$= 8A , $I_{B1}$= -$I_{B2}$= 1.6A | | | 3.0 | μs |
| $t_f$ | Fall Time | | | | 0.7 | μs |