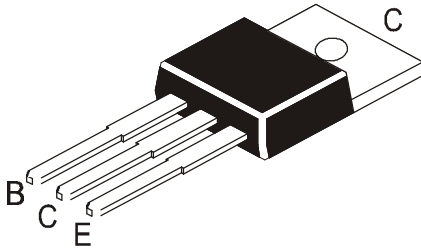


DARLINGTON PLASTIC POWER TRANSISTORS



| | |
|--------|--------|
| TIP120 | TIP125 |
| TIP121 | TIP126 |
| TIP122 | TIP127 |
| NPN | PNP |

TO-220
Plastic Package

High Power Switching, Hammer Drive, Pulse Motor Drive and Inductive Load Drive Applications

ABSOLUTE MAXIMUM RATINGS

| DESCRIPTION | | TIP120/125 | TIP121/126 | TIP122/127 | UNIT |
|--|----------------|--------------|------------|------------|----------------------|
| Collector Emitter Voltage | V_{CEO} | 60 | 80 | 100 | V |
| Collector Base Voltage | V_{CBO} | 60 | 80 | 100 | V |
| Emitter Base Voltage | V_{EBO} | 5 | | | V |
| Collector Current Continuous | I_C | 5 | | | A |
| Collector Current Peak | I_{CM} | 8 | | | A |
| Base Current | I_B | 120 | | | mA |
| Power Dissipation upto $T_c=25^\circ\text{C}$ Derate above 25°C | P_D | 65 | | | W |
| Power Dissipation upto $T_a=25^\circ\text{C}$ Derate above 25°C | P_D | 0.52 | | | W/ $^\circ\text{C}$ |
| Power Dissipation upto $T_a=25^\circ\text{C}$ Derate above 25°C | P_D | 2 | | | W |
| Power Dissipation upto $T_a=25^\circ\text{C}$ Derate above 25°C | P_D | 16 | | | mW/ $^\circ\text{C}$ |
| Unclamped Inductive Load Energy | *E | 50 | | | mJ |
| Operating And Storage Junction Temperature | T_j, T_{stg} | - 65 to +150 | | | $^\circ\text{C}$ |

* $I_C=1\text{A}$, $L=100\text{mH}$, $\text{P.R.F.}=10\text{Hz}$, $V_{CC}=20\text{V}$, $R_{BE}=100\text{W}$

THERMAL RESISTANCE

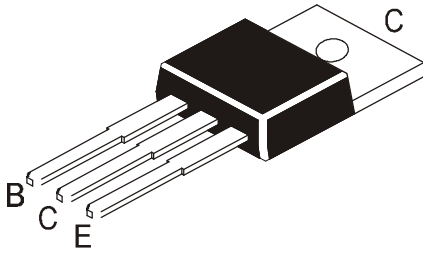
| | | | |
|---------------------------------|---------------|------|--------------------|
| Junction to Case | $R_{th(j-c)}$ | 1.92 | $^\circ\text{C/W}$ |
| Junction to Ambient in free air | $R_{th(j-a)}$ | 62.5 | $^\circ\text{C/W}$ |

ELECTRICAL CHARACTERISTICS ($T_c=25^\circ\text{C}$ unless specified otherwise)

| DESCRIPTION | SYMBOL | TEST CONDITION | TIP120/125 | | TIP121/126 | | TIP122/127 | | UNIT |
|--------------------------------------|------------------|--|--------------|------------|--------------|------------|--------------|------------|----------------|
| | | | MIN | MAX | MIN | MAX | MIN | MAX | |
| Collector Emitter (sus) Voltage | * $V_{CEO(sus)}$ | $I_C=100\text{mA}$, $I_B=0$ | 60 | | 80 | | 100 | | V |
| Collector Cut Off Current | I_{CEO} | $V_{CE}=50\text{V}$, $I_B=0$ $V_{CE}=40\text{V}$, $I_B=0$ $V_{CE}=30\text{V}$, $I_B=0$ | | 0.5 | | 0.5 | | 0.5 | mA mA mA |
| Collector Cut Off Current | I_{CBO} | $V_{CB}=100\text{V}$, $I_E=0$ $V_{CB}=80\text{V}$, $I_E=0$ $V_{CB}=60\text{V}$, $I_E=0$ | | 0.2 | | 0.2 | | 0.2 | mA mA mA |
| Emitter Cut Off Current | I_{EBO} | $V_{EB}=5\text{V}$, $I_C=0$ | | 2.0 | | 2.0 | | 2.0 | mA |
| DC Current Gain | * h_{FE} | $I_C=0.5\text{A}$, $V_{CE}=3\text{V}$ $I_C=3\text{A}$, $V_{CE}=3\text{V}$ | 1000 1000 | | 1000 1000 | | 1000 1000 | | |
| Collector Emitter Saturation Voltage | * $V_{CE(sat)}$ | $I_C=3\text{A}$, $I_B=12\text{mA}$ $I_C=5\text{A}$, $I_B=20\text{mA}$ | | 2.0 4.0 | | 2.0 4.0 | | 2.0 4.0 | V V |
| Base Emitter On Voltage | * $V_{BE(on)}$ | $I_C=3\text{A}$, $V_{CE}=3\text{V}$ | | 2.5 | | 2.5 | | 2.5 | V |

*Pulse Test : Pulse width $\leq 300\text{ms}$, Duty Cycle $\leq 2\%$

DARLINGTON PLASTIC POWER TRANSISTORS



| | |
|--------|--------|
| TIP120 | TIP125 |
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| TIP122 | TIP127 |
| NPN | PNP |

TO-220
Plastic Package

ELECTRICAL CHARACTERISTICS ($T_C=25^\circ\text{C}$ unless specified otherwise)

DYNAMIC CHARACTERISTIC

| DESCRIPTION | SYMBOL | TEST CONDITION | MIN | TYP | MAX | UNIT |
|---------------------------|----------|--|-----|-----|-----|------|
| Small Signal Current Gain | h_{fe} | $I_C=3\text{A}, V_{CE}=4\text{V}, f=1\text{MHz}$ | 4 | | | |
| Output Capacitance | C_{ob} | $V_{CB}=10\text{V}, I_E=0, f=0.1\text{MHz}$ | | | 300 | pF |
| | | TIP125,126,127 TIP120,121,122 | | | 200 | pF |

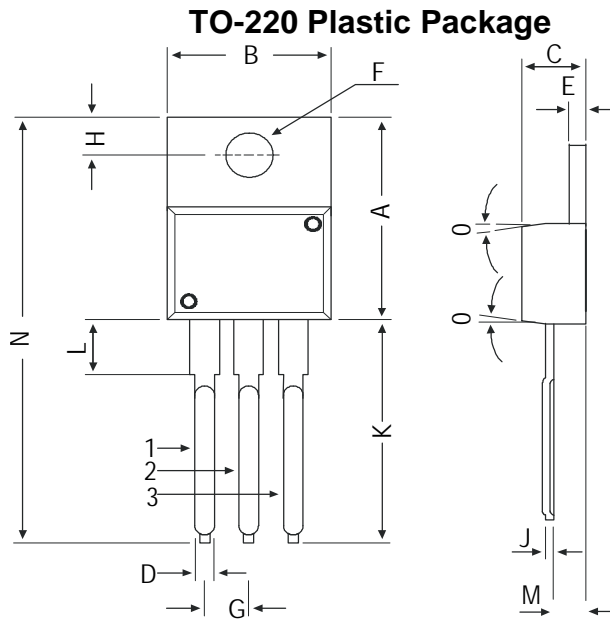
SWITCHING CHARACTERISTICS

| DESCRIPTION | SYMBOL | TEST CONDITION | MIN | TYP | MAX | UNIT |
|---------------|-----------|--|-----|-----|-----|---------------|
| Turn on time | t_{on} | $I_C=3\text{A}, R_L=10\Omega$ $I_{B1}=I_{B2}=12\text{mA}$ | | 0.4 | | μs |
| Turn off time | t_{off} | $V_{EB(off)}=5\text{V}$ | | 1.2 | | μs |

TIP120
TIP121
TIP122
NPN

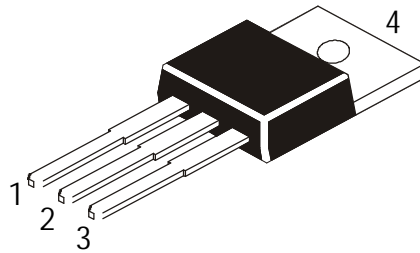
TIP125
TIP126
TIP127
PNP

**TO-220
Plastic Package**



| DIM | MIN | MAX |
|-----|-------|-------|
| A | 14.42 | 16.51 |
| B | 9.63 | 10.67 |
| C | 3.56 | 4.83 |
| D | — | 0.90 |
| E | 1.15 | 1.40 |
| F | 3.75 | 3.88 |
| G | 2.29 | 2.79 |
| H | 2.54 | 3.43 |
| J | — | 0.56 |
| K | 12.70 | 14.73 |
| L | 2.80 | 4.07 |
| M | 2.03 | 2.92 |
| N | — | 31.24 |
| O | 7 DEG | |

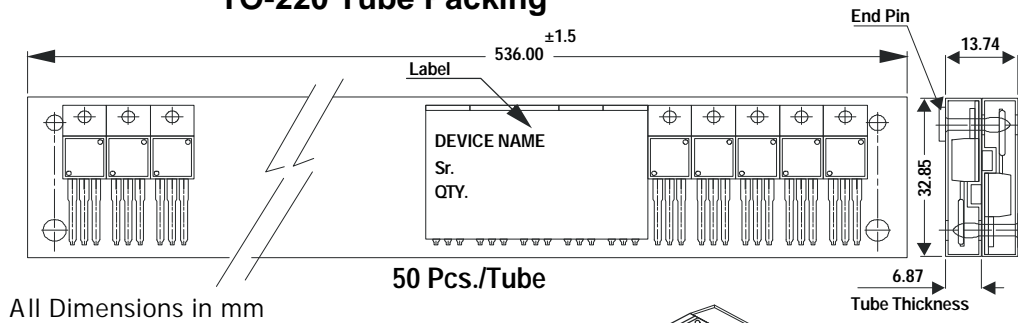
All diminsions in mm.



Pin Configuration

1. Base
2. Collector
3. Emitter
4. Collector

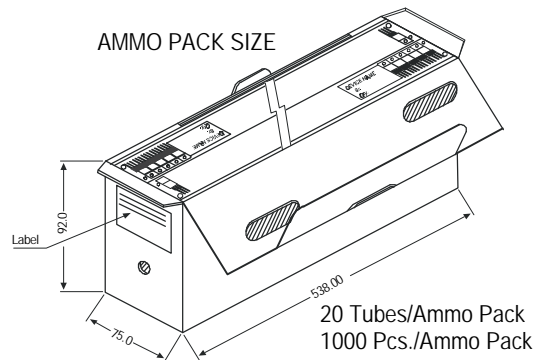
TO-220 Tube Packing



All Dimensions in mm

50 Pcs./Tube

AMMO PACK SIZE



Packing Detail

| PACKAGE | STANDARD PACK | | INNER CARTON BOX | | OUTER CARTON BOX | | |
|------------|-----------------|----------------|---------------------|------|-------------------|-------|--------|
| | Details | Net Weight/Qty | Size | Qty | Size | Qty | Gr Wt |
| TO-220 /FP | 200 pcs/polybag | 396 gm/200 pcs | 3" x 7.5" x 7.5" | 1.0K | 17" x 15" x 13.5" | 16.0K | 36 kgs |
| | 50 pcs/tube | 120 gm/50 pcs | 3.5" x 3.7" x 21.5" | 1.0K | 19" x 19" x 19" | 10.0K | 29 kgs |

Disclaimer

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