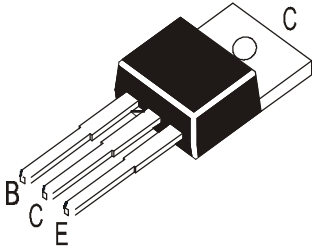


## PLASTIC POWER TRANSISTORS

TIP31, A, B, C NPN  
TIP32, A, B, C PNP

TO-220  
Plastic Package



Complementary Silicon Transistors intended for a wide variety of Switching and Amplifier Applications, Series and Shunt Regulators, Driver and Output stages of Hi-Fi Amplifiers

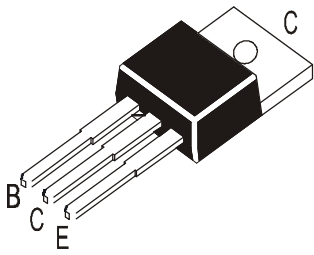
### ABSOLUTE MAXIMUM RATINGS ( $T_a=25^\circ\text{C}$ )

| DESCRIPTION                                   | SYMBOL         | TIP31        | TIP31A | TIP31B | TIP31C | UNIT                 |
|---|----------------|--------------|--------|--------|--------|----------------------|
|   |                | TIP32        | TIP32A | TIP32B | TIP32C |                      |
| Collector Emitter Voltage                     | $V_{CEO}$      | 40           | 60     | 80     | 100    | V                    |
| Collector Base Voltage                        | $V_{CBO}$      | 40           | 60     | 80     | 100    | V                    |
| Emitter Base Voltage                          | $V_{EBO}$      | 5            |        |        |        | V                    |
| Collector Current Continuous                  | $I_C$          | 3            |        |        |        | A                    |
| Collector Current Peak                        | $I_{CM}$       | 5            |        |        |        | A                    |
| Base Current                                  | $I_B$          | 1            |        |        |        | A                    |
| Power Dissipation upto $T_c=25^\circ\text{C}$ | $P_D$          | 40           |        |        |        | W                    |
| Derate above $25^\circ\text{C}$               |                | 320          |        |        |        | mW/ $^\circ\text{C}$ |
| Power Dissipation upto $T_a=25^\circ\text{C}$ | $P_D$          | 2            |        |        |        | W                    |
| Derate above $25^\circ\text{C}$               |                | 16           |        |        |        | mW/ $^\circ\text{C}$ |
| Unclamped Inductive Load Energy               | *E             | 32           |        |        |        | mJ                   |
| Operating And Storage Junction Temperature    | $T_j, T_{stg}$ | - 65 to +150 |        |        |        | $^\circ\text{C}$     |

### THERMAL RESISTANCE

|                                 |               |       |                    |
|---------------------------------|---------------|-------|--------------------|
| Junction to Case                | $R_{th(j-c)}$ | 3.125 | $^\circ\text{C/W}$ |
| Junction to Ambient in free air | $R_{th(j-a)}$ | 62.5  | $^\circ\text{C/W}$ |

\*  $I_C=1.8\text{A}$ ,  $L=20\text{mH}$ ,  $P.R.F.=10\text{Hz}$ ,  $V_{CC}=10\text{V}$ ,  $R_{BE}=100\Omega$



**ELECTRICAL CHARACTERISTICS (T<sub>c</sub>=25°C unless specified otherwise )**

| DESCRIPTION                          | SYMBOL                 | TEST CONDITION  | MIN | MAX | UNIT |
|--------------------------------------|------------------------|---|-----|-----|------|
| Collector Emitter (sus) Voltage      | *V <sub>CEO(sus)</sub> | I <sub>C</sub> =30mA, I <sub>B</sub> =0                     |     |     |      |
|                                      |                        | <b>TIP31/32</b>   | 40  |     | V    |
|                                      |                        | <b>TIP31A/32A</b>   | 60  |     | V    |
|                                      |                        | <b>TIP31B/32B</b>   | 80  |     | V    |
|                                      |                        | <b>TIP31C/32C</b>   | 100 |     | V    |
| Collector Cut off Current            | I <sub>CEO</sub>       | V <sub>CE</sub> =30V, I <sub>B</sub> =0                     |     |     |      |
|                                      |                        | <b>TIP31, A / 32, A</b>                                     |     | 0.3 | mA   |
|                                      |                        | V <sub>CE</sub> =60V, I <sub>B</sub> =0                     |     |     |      |
|                                      |                        | <b>TIP31B, C / 32B, C</b>                                   |     | 0.3 | mA   |
| Collector Cut off Current            | I <sub>CES</sub>       | V <sub>CE</sub> =V <sub>CEO(max)</sub> , V <sub>BE</sub> =0 |     | 0.2 | mA   |
| Emitter Cut off Current              | I <sub>EBO</sub>       | V <sub>EB</sub> =5V, I <sub>C</sub> =0                      |     | 1.0 | mA   |
| DC Current Gain                      | *h <sub>FE</sub>       | I <sub>C</sub> =1A, V <sub>CE</sub> =4V                     | 25  |     |      |
|                                      |                        | I <sub>C</sub> =3A, V <sub>CE</sub> =4V                     | 10  | 50  |      |
| Collector Emitter Saturation Voltage | *V <sub>CE(sat)</sub>  | I <sub>C</sub> =3A, I <sub>B</sub> =375mA                   |     | 1.2 | V    |
| Base Emitter on Voltage              | *V <sub>BE(on)</sub>   | I <sub>C</sub> =3A, V <sub>CE</sub> =4V                     |     | 1.8 | V    |

\*Pulse Test : Pulse width ≤300μs, Duty Cycle ≤2%

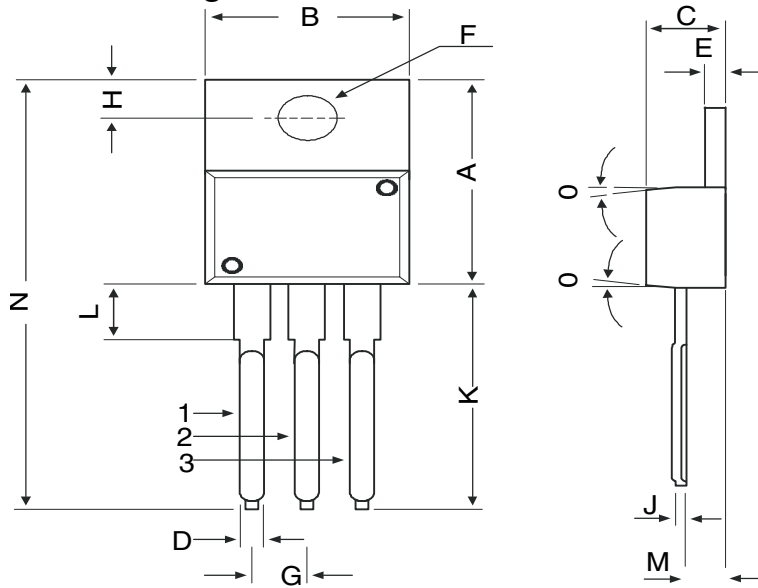
**DYNAMIC CHARACTERISTIC**

| DESCRIPTION               | SYMBOL          | TEST CONDITION                                     | MIN | MAX | UNIT |
|---------------------------|-----------------|--|-----|-----|------|
| Small Signal Current Gain | h <sub>fe</sub> | I <sub>C</sub> =0.5A, V <sub>CE</sub> =10V, f=1KHz | 20  |     |      |
| Transition Frequency      | f <sub>T</sub>  | I <sub>C</sub> =0.5A, V <sub>CE</sub> =10V, f=1MHz | 3   |     | MHz  |

TIP31, A, B, C NPN  
TIP32, A, B, C PNP

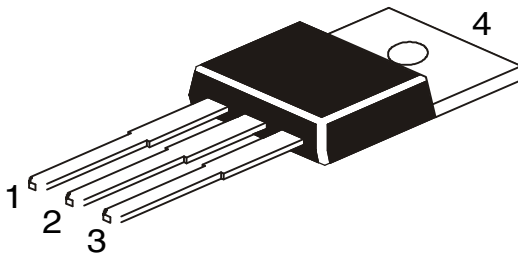
**TO-220**  
**Plastic Package**

**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 |       |

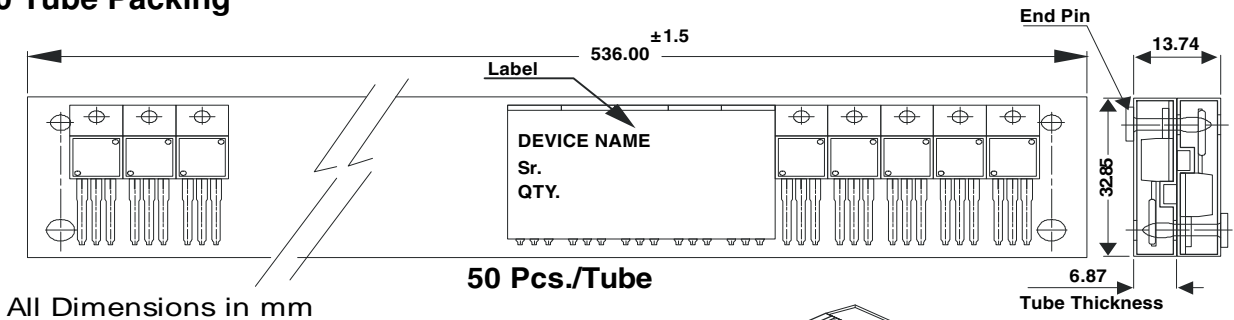
All diminsions in mm.



**Pin Configuration**

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

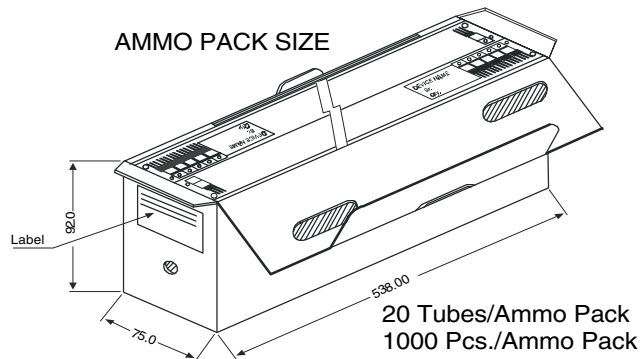
**TO-220 Tube Packing**



All Dimensions in mm

50 Pcs./Tube

**AMMO PACK SIZE**



20 Tubes/Ammo Pack  
1000 Pcs./Ammo Pack

**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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