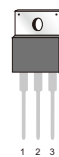


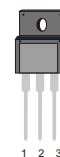
## FEATURES

- Low saturation voltage
- High current output up to 3A
- Complementary to TIP41C
- High Stability and High Reliability

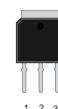
TO-220



ITO-220



TO-251



TO-252



## MECHANICAL DATA

- Case: TO-220, ITO-220, TO-251, TO-252 Package
- Terminals: Plated solderable per MIL-STD-750, method 2026
- Mounting Position: Any

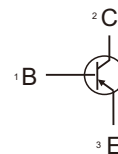


Table1 Absolute Maximum Ratings ( $T_C=25^{\circ}\text{C}$ , unless otherwise specified)

| Parameter                                  | Symbol    | Unit               | Value                    |         |
|--------------------------------------------|-----------|--------------------|--------------------------|---------|
| Collector-Emitter Voltage                  | $V_{CEO}$ | V                  | -100                     |         |
| Collector-Base Voltage                     | $V_{CBO}$ | V                  | -100                     |         |
| Emitter-Base Voltage                       | $V_{EBO}$ | V                  | -5.0                     |         |
| Collector Current (DC)                     | $I_C$     | A                  | -3                       |         |
| Collector Current (Pulse)                  | $I_{CP}$  | A                  | -5                       |         |
| Base Current (DC)                          | $I_B$     | A                  | -1                       |         |
| Power Dissipation $T_C=25^{\circ}\text{C}$ | $P_D$     | W                  | TO-220/<br>TO-252/TO-251 | ITO-220 |
|                                            |           |                    | 40                       | 27.8    |
| Operation Junction Temperature             | $T_J$     | $^{\circ}\text{C}$ | -55 to +150              |         |
| Storage Temperature                        | $T_{STG}$ | $^{\circ}\text{C}$ | -55 to +150              |         |

Table 2. Thermal Characteristics

| Parameter                           | Symbol          | TO-220/<br>TO-252/TO-251 | ITO-220 | Unit                        |
|-------------------------------------|-----------------|--------------------------|---------|-----------------------------|
| Thermal resistance Junction to Case | $R_{\theta JC}$ | 3.5                      | 4.5     | $^{\circ}\text{C}/\text{W}$ |

# TIP42C

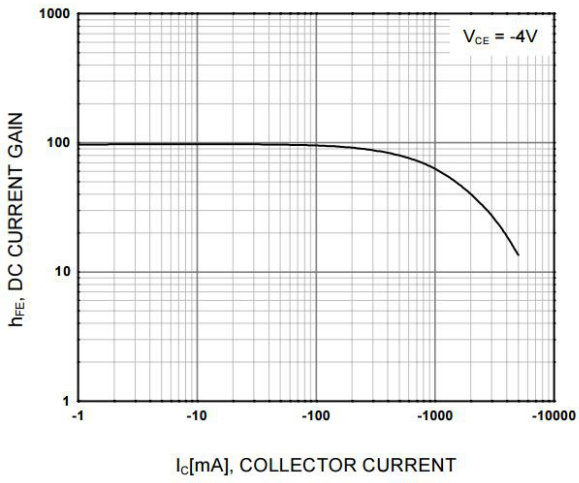
## ELECTRICAL CHARACTERISTICS( $T_C=25^{\circ}\text{C}$ Unless otherwise specified)

| Parameter                            | Symbol        | Unit          | Conditions                                                  | Min  | Max   |
|--------------------------------------|---------------|---------------|-------------------------------------------------------------|------|-------|
| Collector-Emitter Breakdown Voltage  | $V_{(BR)CEO}$ | V             | $I_C=-10\text{mA}, I_B=0$                                   | -100 | ---   |
| Collector-Base Breakdown Voltage     | $V_{(BR)CBO}$ | V             | $I_C=-100\mu\text{A}, I_E=0$                                | -100 | ---   |
| Emitter-Base Breakdown Voltage       | $V_{(BR)EBO}$ | V             | $I_E=-100\mu\text{A}, I_C=0$                                | -5.0 | ---   |
| Collector cut-off Current            | $I_{CEO}$     | $\mu\text{A}$ | $V_{CE}=-100\text{V}, I_B=0$                                | ---  | 100   |
| Collector -emitter cut-off Current   | $I_{CES}$     | $\mu\text{A}$ | $V_{CE}=-100\text{V}$                                       | ---  | 100   |
| Emitter cut-off Current              | $I_{EBO}$     | $\mu\text{A}$ | $V_{EB}=-5\text{V}, I_C=0$                                  | ---  | 100   |
| DC Current Gain                      | $h_{FE(1)}$   |               | $I_C=-10\text{mA}, V_{CE}=-5\text{V}$                       | 30   | 300   |
|                                      | $h_{FE(2)}$   |               | $I_C=-1\text{A}, V_{CE}=-5\text{V}$                         | 60   | 200   |
|                                      | $h_{FE(3)}$   |               | $I_C=-3\text{A}, V_{CE}=-5\text{V}$                         | 15   | 300   |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | V             | $I_C=-0.5\text{A}, I_B=-50\text{mA}$                        | ---  | -0.40 |
|                                      |               |               | $I_C=-1\text{A}, I_B=-100\text{mA}$                         | ---  | -0.50 |
|                                      |               |               | $I_C=-3\text{A}, I_B=-300\text{mA}$                         | ---  | -0.80 |
| Base-Emitter Saturation Voltage      | $V_{BE(sat)}$ | V             | $I_C=-3\text{A}, I_B=-300\text{mA}$                         | ---  | -1.50 |
| Transition frequency                 | $f_T$         | MHZ           | $I_C=-500\text{mA}, V_{CE}=-10\text{V}$<br>$f=10\text{MHZ}$ | 3    | ---   |

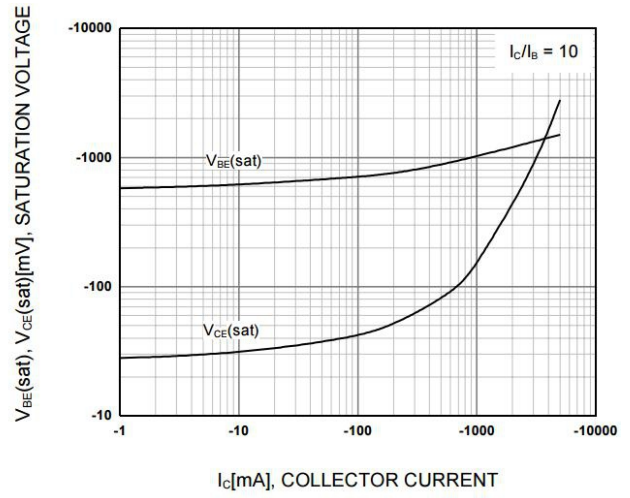
## CLASSIFICATION OF $h_{FE(2)}$

| $h_{FE}$ | 60-200 |        |         |         |         |         |
|----------|--------|--------|---------|---------|---------|---------|
| Rank     | 1      | 2      | 3       | 4       | 5       | 6       |
| Range    | 60-80  | 80-100 | 100-120 | 120-140 | 140-160 | 160-200 |

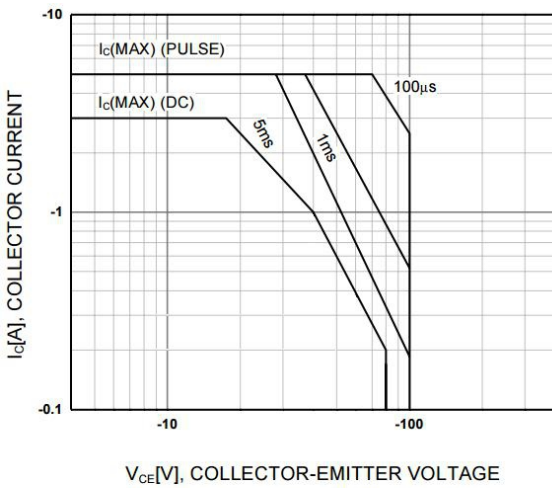
## Characteristics(Typical)



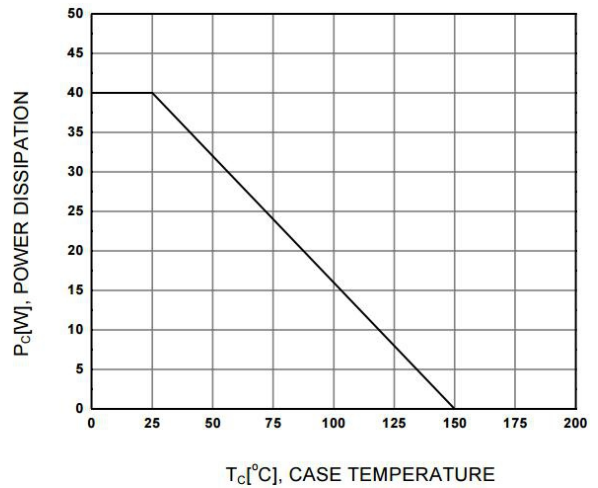
**Figure 1. DC current Gain**



**Figure 2. Base-Emitter Saturation Voltage  
Collector-Emitter Saturation Voltage**

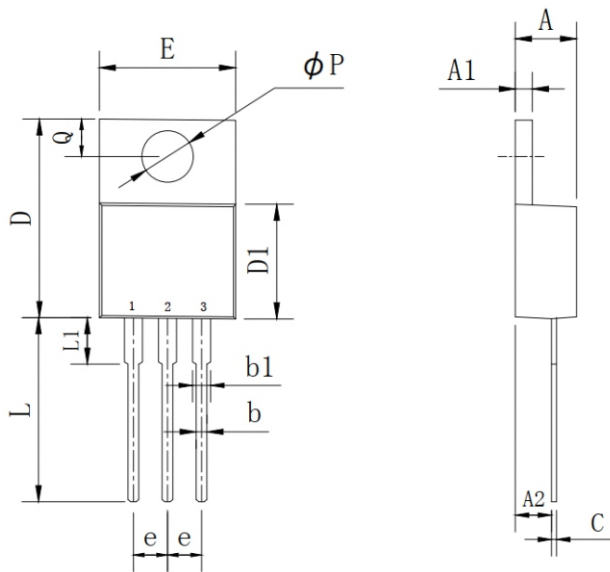


**Figure 3. Safe Operating Area**



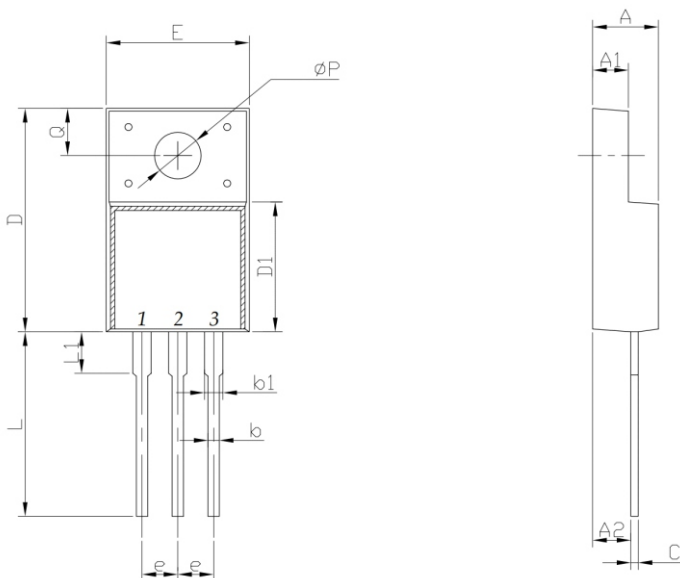
**Figure 4. Power Derating**

## TO-220 PACKAGE OUTLINE DIMENSIONS



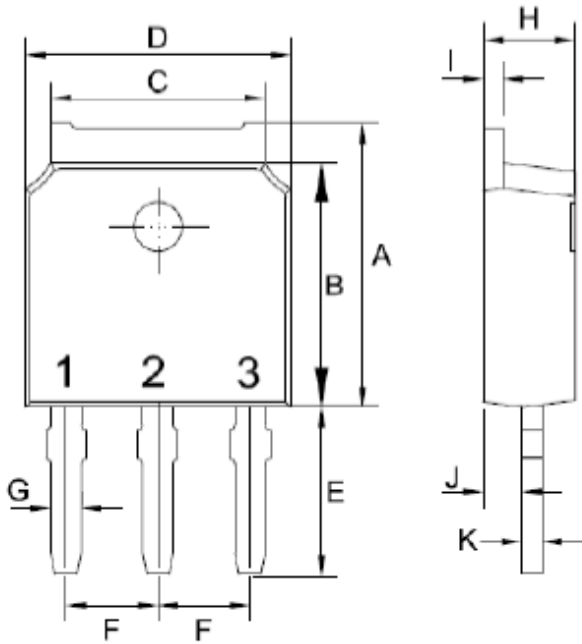
| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | MIN                       | MAX   | MIN                  | MAX   |
| A      | 4.25                      | 4.87  | 0.167                | 0.192 |
| A1     | 1.07                      | 1.47  | 0.042                | 0.058 |
| A2     | 2.03                      | 2.92  | 0.080                | 0.115 |
| b      | 0.51                      | 1.11  | 0.020                | 0.044 |
| b1     | 0.97                      | 1.6   | 0.038                | 0.063 |
| C      | 0.3                       | 0.7   | 0.012                | 0.028 |
| D      | 14.6                      | 15.9  | 0.575                | 0.626 |
| D1     | 8.04                      | 9.3   | 0.317                | 0.366 |
| E      | 9.57                      | 10.57 | 0.377                | 0.416 |
| e      | 2.34                      | 2.74  | 0.092                | 0.108 |
| L      | 12.58                     | 14.3  | 0.495                | 0.563 |
| L1     | 2.8                       | 4.2   | 0.110                | 0.165 |
| P      | 3.4                       | 4.14  | 0.134                | 0.163 |
| Q      | 2.45                      | 3     | 0.096                | 0.118 |

## ITO-220 PACKAGE OUTLINE DIMENSIONS



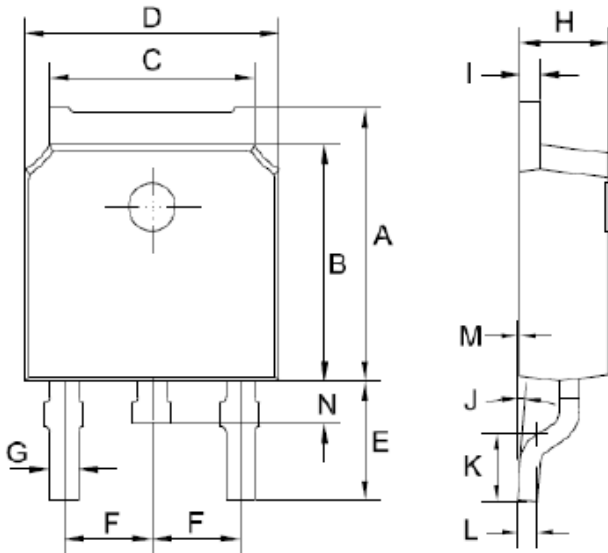
| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | MIN                       | MAX   | MIN                  | MAX   |
| A      | 4.24                      | 4.9   | 0.167                | 0.193 |
| A1     | 2.3                       | 2.92  | 0.091                | 0.115 |
| A2     | 2.61                      | 2.81  | 0.103                | 0.111 |
| b      | 0.3                       | 1     | 0.012                | 0.039 |
| b1     | 0.9                       | 1.55  | 0.035                | 0.061 |
| C      | 0.3                       | 0.7   | 0.012                | 0.028 |
| D      | 14.5                      | 16.36 | 0.571                | 0.644 |
| D1     | 8.8                       | 9.41  | 0.346                | 0.370 |
| E      | 9.5                       | 10.5  | 0.374                | 0.413 |
| e      | 2.3                       | 2.75  | 0.091                | 0.108 |
| L      | 12.6                      | 14    | 0.496                | 0.551 |
| L1     | 2.45                      | 4.3   | 0.096                | 0.169 |
| P      | 2.9                       | 3.8   | 0.114                | 0.150 |
| Q      | 2.5                       | 3.55  | 0.098                | 0.140 |

TO-251 PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters |      | Dimensions In Inches |       |
|--------|---------------------------|------|----------------------|-------|
|        | MIN                       | MAX  | MIN                  | MAX   |
| A      | 6.85                      | 7.25 | 0.270                | 0.285 |
| B      | 5.8                       | 6.3  | 0.228                | 0.248 |
| C      | 5                         | 5.53 | 0.197                | 0.218 |
| D      | 6.3                       | 6.8  | 0.248                | 0.268 |
| E      | 3.5                       | 4.35 | 0.138                | 0.171 |
| F      | 2.19                      | 2.39 | 0.086                | 0.094 |
| G      | 0.45                      | 0.85 | 0.018                | 0.033 |
| H      | 2.2                       | 2.4  | 0.087                | 0.094 |
| I      | 0.41                      | 0.61 | 0.016                | 0.024 |
| J      | 0.71                      | 1.31 | 0.028                | 0.052 |
| K      | 0.41                      | 0.61 | 0.016                | 0.024 |

TO-252 PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters |      | Dimensions In Inches |       |
|--------|---------------------------|------|----------------------|-------|
|        | MIN                       | MAX  | MIN                  | MAX   |
| A      | 6.85                      | 7.25 | 0.270                | 0.285 |
| B      | 5.8                       | 6.3  | 0.228                | 0.248 |
| C      | 5                         | 5.53 | 0.197                | 0.218 |
| D      | 6.3                       | 6.8  | 0.248                | 0.268 |
| E      | 2.6                       | 3.3  | 0.102                | 0.130 |
| F      | 2.19                      | 2.39 | 0.086                | 0.094 |
| G      | 0.45                      | 0.85 | 0.018                | 0.033 |
| H      | 2.2                       | 2.4  | 0.087                | 0.094 |
| I      | 0.41                      | 0.61 | 0.016                | 0.024 |
| J      | 0°                        | 8°   | 0°                   | 8     |
| K      | 1.45                      | 1.85 | 0.057                | 0.073 |
| L      | 0.41                      | 0.61 | 0.016                | 0.024 |
| M      | 0                         | 0.12 | 0.000                | 0.005 |
| P      | 0.6                       | 1    | 0.024                | 0.039 |

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