

## isc Silicon NPN Darlington Power Transistor

TIP142T

## DESCRIPTION

- High DC Current Gain-  
:  $h_{FE} = 1000(\text{Min}) @ I_C = 5A$
- Collector-Emitter Sustaining Voltage-  
:  $V_{CEO(\text{SUS})} = 100V(\text{Min})$
- Complement to Type TIP147T
- Minimum Lot-to-Lot variations for robust device performance and reliable operation

## APPLICATIONS

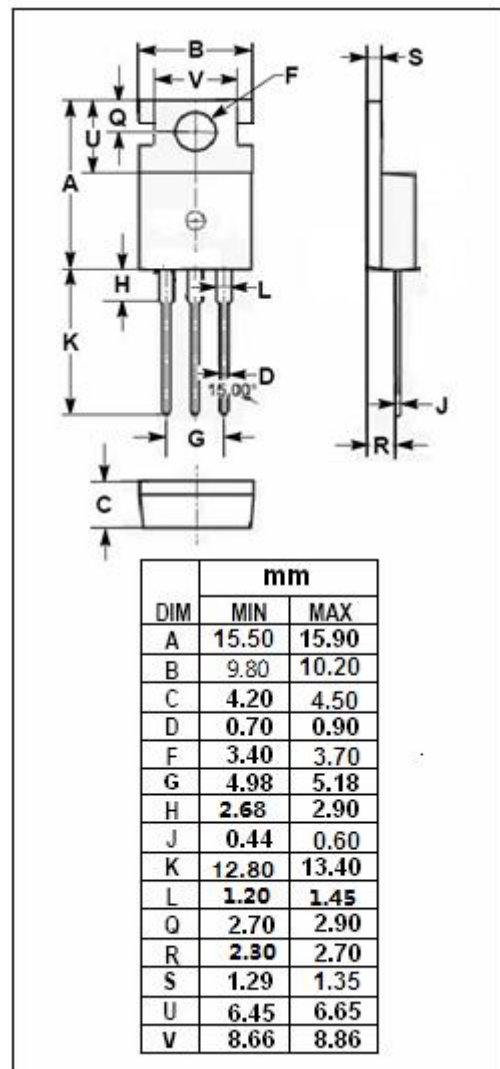
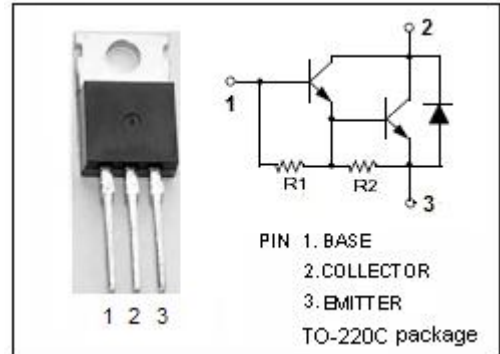
- Designed for general purpose amplifier and low speed switching applications.

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

| SYMBOL    | PARAMETER                                                 | VALUE   | UNIT             |
|-----------|-----------------------------------------------------------|---------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                                    | 100     | V                |
| $V_{CEO}$ | Collector-Emitter Voltage                                 | 100     | V                |
| $V_{EBO}$ | Emitter-Base Voltage                                      | 5       | V                |
| $I_C$     | Collector Current-Continuous                              | 10      | A                |
| $I_{CM}$  | Collector Current-Peak                                    | 15      | A                |
| $I_B$     | Base Current- Continuous                                  | 0.5     | A                |
| $P_C$     | Collector Power Dissipation<br>@ $T_C = 25^\circ\text{C}$ | 80      | W                |
| $T_j$     | Junction Temperature                                      | 150     | $^\circ\text{C}$ |
| $T_{stg}$ | Storage Temperature Range                                 | -55~150 | $^\circ\text{C}$ |

## THERMAL CHARACTERISTICS

| SYMBOL       | PARAMETER                            | MAX  | UNIT               |
|--------------|--------------------------------------|------|--------------------|
| $R_{th j-c}$ | Thermal Resistance, Junction to Case | 1.56 | $^\circ\text{C/W}$ |



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## ELECTRICAL CHARACTERISTICS

 $T_C=25^{\circ}\text{C}$  unless otherwise specified

| SYMBOL          | PARAMETER                            | CONDITIONS                                | MIN  | TYP. | MAX | UNIT |
|-----------------|--------------------------------------|-------------------------------------------|------|------|-----|------|
| $V_{CEO(SUS)}$  | Collector-Emitter Sustaining Voltage | $I_C = 30\text{mA}$ , $I_B = 0$           | 100  |      |     | V    |
| $V_{CE(sat)-1}$ | Collector-Emitter Saturation Voltage | $I_C = 5\text{A}$ , $I_B = 10\text{mA}$   |      |      | 2.0 | V    |
| $V_{CE(sat)-2}$ | Collector-Emitter Saturation Voltage | $I_C = 10\text{A}$ , $I_B = 40\text{mA}$  |      |      | 3.0 | V    |
| $V_{BE(sat)}$   | Base-Emitter Saturation Voltage      | $I_C = 10\text{A}$ , $I_B = 40\text{mA}$  |      |      | 3.5 | V    |
| $V_{BE(on)}$    | Base-Emitter On Voltage              | $I_C = 10\text{A}$ ; $V_{CE} = 4\text{V}$ |      |      | 3.0 | V    |
| $I_{CBO}$       | Collector Cutoff current             | $V_{CB} = 100\text{V}$ , $I_E = 0$        |      |      | 1   | mA   |
| $I_{CEO}$       | Collector Cutoff current             | $V_{CE} = 50\text{V}$ , $I_B = 0$         |      |      | 2   | mA   |
| $I_{EBO}$       | Emitter Cutoff Current               | $V_{EB} = 5\text{V}$ ; $I_C = 0$          |      |      | 2   | mA   |
| $h_{FE-1}$      | DC Current Gain                      | $I_C = 5\text{A}$ ; $V_{CE} = 4\text{V}$  | 1000 |      |     |      |
| $h_{FE-2}$      | DC Current Gain                      | $I_C = 10\text{A}$ ; $V_{CE} = 4\text{V}$ | 500  |      |     |      |

## Switching Times

|           |              |                                                                                                                                             |  |      |  |               |
|-----------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------|--|------|--|---------------|
| $t_d$     | Delay Time   | $V_{CC} = 30\text{V}$ , $I_C = 5.0\text{A}$ ,<br>$I_{B1} = -I_{B2} = 20\text{mA}$ ; $t_p = 20\text{ }\mu\text{s}$<br>Duty Cycle $\leq 20\%$ |  | 0.15 |  | $\mu\text{s}$ |
| $t_r$     | Rise Time    |                                                                                                                                             |  | 0.55 |  | $\mu\text{s}$ |
| $t_{stg}$ | Storage Time |                                                                                                                                             |  | 2.5  |  | $\mu\text{s}$ |
| $t_f$     | Fall Time    |                                                                                                                                             |  | 2.5  |  | $\mu\text{s}$ |

**isc Silicon NPN Darlington Power Transistor****TIP142T****NOTICE:**

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