

## SPTECH Silicon PNP Darlington Power Transistor

TIP147P

## DESCRIPTION

- High DC Current Gain-  
:  $h_{FE} = 1000(\text{Min}) @ I_C = -5\text{A}$
- Collector-Emitter Sustaining Voltage-  
:  $V_{CEQ(\text{SUS})} = -100\text{V}(\text{Min})$
- Complement to Type TIP142

## APPLICATIONS

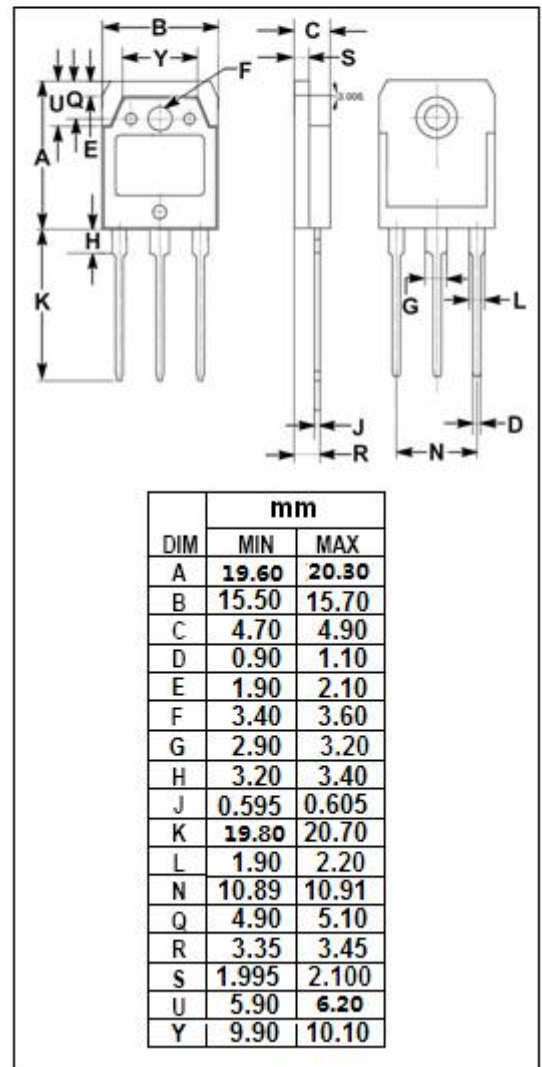
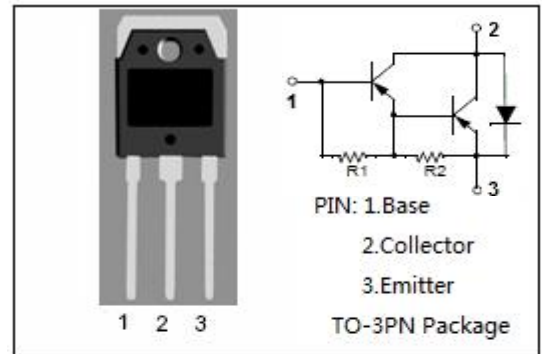
- Designed for general purpose amplifier and low frequency switching applications.

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>@ $T_C = 25^\circ\text{C}$ | 125     | W                |
| $T_j$     | Junction Temperature                                      | 150     | $^\circ\text{C}$ |
| $T_{stg}$ | Storage Temperature Range                                 | -65~150 | $^\circ\text{C}$ |

## THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                               | MAX  | UNIT               |
|---------------|-----------------------------------------|------|--------------------|
| $R_{th\ j-c}$ | Thermal Resistance, Junction to Case    | 1.0  | $^\circ\text{C/W}$ |
| $R_{th\ j-a}$ | Thermal Resistance, Junction to Ambient | 35.7 | $^\circ\text{C/W}$ |



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## ELECTRICAL CHARACTERISTICS

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

| SYMBOL          | PARAMETER                            | CONDITIONS                                  | MIN  | TYP. | MAX  | UNIT |
|-----------------|--------------------------------------|---------------------------------------------|------|------|------|------|
| $V_{CEQ(SUS)}$  | 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>$I_B = -20\text{mA}$ ;<br>Duty Cycle $\leq 20\%$<br>$I_{B1} = I_{B2}$ ,<br>$R_C$ & $R_B$ Varied,<br>$T_J = 25^{\circ}\text{C}$ |  | 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  |  | $\mu\text{s}$ |