

## SPTECH Silicon NPN Power Transistor

2SC3157

## DESCRIPTION

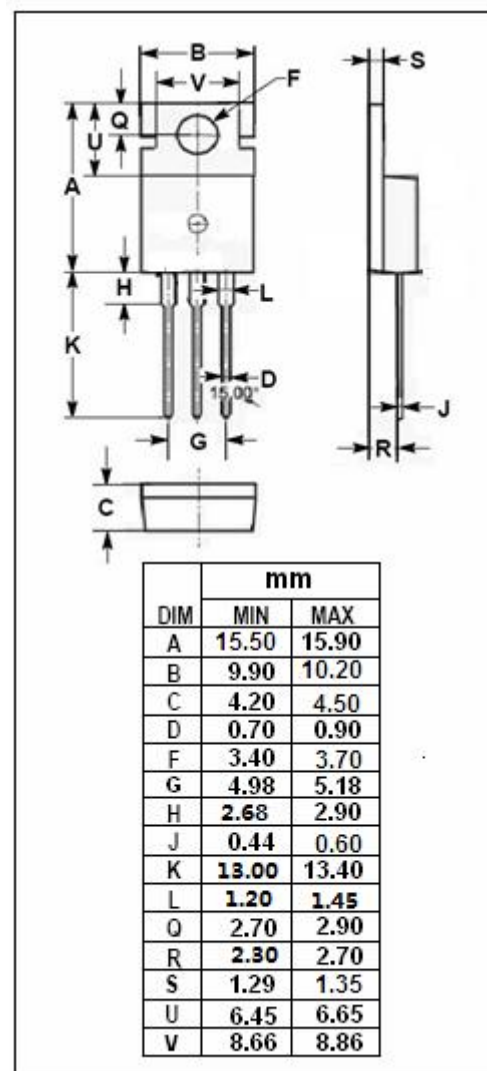
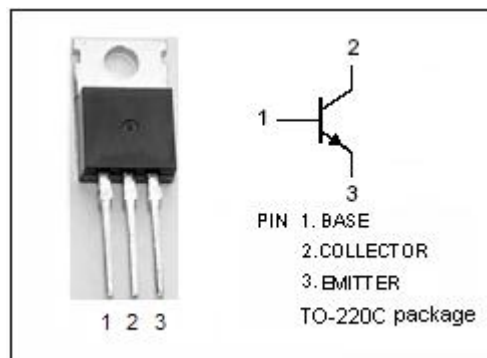
- Low Collector Saturation Voltage-  
:  $V_{CE(sat)} = 0.6V(\text{Max.}) @ I_C = 5A$
- Fast Switching Speed
- Complement to Type 2SA1261

## APPLICATIONS

- Developed for high-voltage high-speed switching, and is ideal for use as a driver in devices such as switching regulators, DC/DC converters, and high frequency power amplifiers.

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

| SYMBOL    | PARAMETER                                               | VALUE   | UNIT             |
|-----------|---------------------------------------------------------|---------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                                  | 150     | V                |
| $V_{CEO}$ | Collector-Emitter Voltage                               | 100     | V                |
| $V_{EBO}$ | Emitter-Base Voltage                                    | 7.0     | V                |
| $I_C$     | Collector Current-Continuous                            | 10      | A                |
| $I_{CM}$  | Collector Current-Peak                                  | 20      | A                |
| $I_B$     | Base Current-Continuous                                 | 3.5     | A                |
| $P_C$     | Collector Power Dissipation<br>@ $T_a=25^\circ\text{C}$ | 1.5     | W                |
|           | Collector Power Dissipation<br>@ $T_c=25^\circ\text{C}$ | 60      |                  |
| $T_J$     | Junction Temperature                                    | 150     | $^\circ\text{C}$ |
| $T_{stg}$ | Storage Temperature Range                               | -55~150 | $^\circ\text{C}$ |



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## ELECTRICAL CHARACTERISTICS

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

| SYMBOL         | PARAMETER                            | CONDITIONS                                                                                                                | MIN | MAX       | UNIT                |
|----------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----|-----------|---------------------|
| $V_{CEQ(SUS)}$ | Collector-Emitter Sustaining Voltage | $I_C=50\text{mA}; I_B=0$                                                                                                  | 100 |           | V                   |
| $V_{CE(sat)}$  | Collector-Emitter Saturation Voltage | $I_C=5.0\text{A}; I_B=0.5\text{A}$                                                                                        |     | 0.6       | V                   |
| $V_{BE(sat)}$  | Base-Emitter Saturation Voltage      | $I_C=5.0\text{A}; I_B=0.5\text{A}$                                                                                        |     | 1.5       | V                   |
| $I_{CBO}$      | Collector Cutoff Current             | $V_{CB}=100\text{V}; I_E=0$                                                                                               |     | 10        | $\mu\text{A}$       |
| $I_{CEX}$      | Collector Cutoff Current             | $V_{CE}=100\text{V}; V_{BE(off)}=-1.5\text{V}$<br>$V_{CE}=100\text{V}; V_{BE(off)}=-1.5\text{V}, T_a=125^{\circ}\text{C}$ |     | 10<br>1.0 | $\mu\text{A}$<br>mA |
| $I_{EBO}$      | Emitter Cutoff Current               | $V_{EB}=5\text{V}; I_C=0$                                                                                                 |     | 10        | $\mu\text{A}$       |
| $h_{FE-1}$     | DC Current Gain                      | $I_C=0.5\text{A}; V_{CE}=5\text{V}$                                                                                       | 40  | 200       |                     |
| $h_{FE-2}$     | DC Current Gain                      | $I_C=3.0\text{A}; V_{CE}=5\text{V}$                                                                                       | 40  | 200       |                     |
| $h_{FE-3}$     | DC Current Gain                      | $I_C=5.0\text{A}; V_{CE}=5\text{V}$                                                                                       | 20  |           |                     |

## Switching times

|           |              |                                                                                            |  |     |               |
|-----------|--------------|--------------------------------------------------------------------------------------------|--|-----|---------------|
| $t_{on}$  | Turn-on Time | $I_C=5.0\text{A}, R_L=10\Omega,$<br>$I_{B1}=-I_{B2}=0.5\text{A}, V_{CC}\approx 50\text{V}$ |  | 0.5 | $\mu\text{s}$ |
| $t_{stg}$ | Storage Time |                                                                                            |  | 1.5 | $\mu\text{s}$ |
| $t_f$     | Fall Time    |                                                                                            |  | 0.5 | $\mu\text{s}$ |

◆  $h_{FE-2}$  Classifications

| M     | L      | K       |
|-------|--------|---------|
| 40-80 | 60-120 | 100-200 |