

## SPTECH Silicon NPN Power Transistor

### DESCRIPTION

- Collector-Emitter Sustaining Voltage-  
 $V_{CEO(SUS)} = 400V(\text{Min})$
- High Power Dissipation
- DARLINGTON

### APPLICATIONS

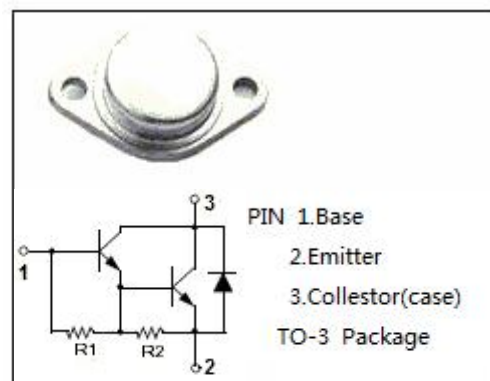
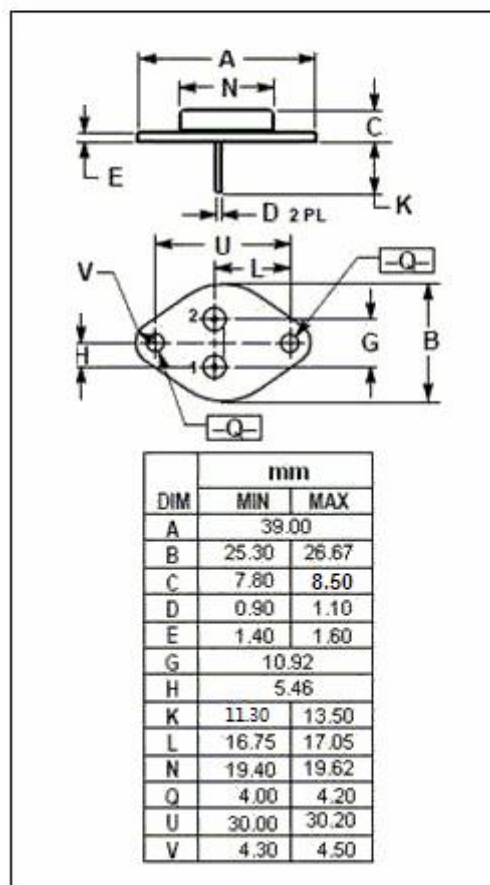
- Automotive ignition
- Switching regulator
- Motor control applications

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

| SYMBOL    | PARAMETER                                               | VALUE   | UNIT             |
|-----------|---------------------------------------------------------|---------|------------------|
| $V_{CBO}$ | Collector-Base Voltage                                  | 600     | V                |
| $V_{CEO}$ | Collector-Emitter Voltage                               | 400     | V                |
| $V_{EBO}$ | Emitter-Base Voltage                                    | 8       | V                |
| $I_C$     | Collector Current-Continuous                            | 10      | A                |
| $I_{CM}$  | Collector Current-peak                                  | 15      | A                |
| $I_B$     | Base Current                                            | 2       | A                |
| $P_C$     | Collector Power Dissipation<br>@ $T_C=25^\circ\text{C}$ | 175     | 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 | $^\circ\text{C/W}$ |



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### ELECTRICAL CHARACTERISTICS

T<sub>j</sub>=25°C unless otherwise specified

| SYMBOL                 | PARAMETER                            | CONDITIONS                                                            | MIN | TYP | MAX  | UNIT |
|------------------------|--------------------------------------|-----------------------------------------------------------------------|-----|-----|------|------|
| V <sub>CEQ(SUS)</sub>  | Collector-Emitter Sustaining Voltage | I <sub>C</sub> = 30mA ; I <sub>B</sub> = 0                            | 400 |     |      | V    |
| V <sub>CE(sat)-1</sub> | Collector-Emitter Saturation Voltage | I <sub>C</sub> = 3A; I <sub>B</sub> = 0.6A                            |     |     | 1.5  | V    |
| V <sub>CE(sat)-2</sub> | Collector-Emitter Saturation Voltage | I <sub>C</sub> = 6A; I <sub>B</sub> = 0.6A                            |     |     | 2.0  | V    |
| V <sub>CE(sat)-3</sub> | Collector-Emitter Saturation Voltage | I <sub>C</sub> = 10A; I <sub>B</sub> = 2A                             |     |     | 2.5  | V    |
| V <sub>BE(sat)-1</sub> | Base-Emitter Saturation Voltage      | I <sub>C</sub> = 6A; I <sub>B</sub> = 0.6A                            |     |     | 2.5  | V    |
| V <sub>BE(sat)-2</sub> | Base-Emitter Saturation Voltage      | I <sub>C</sub> = 10A; I <sub>B</sub> = 2A                             |     |     | 3.0  | V    |
| V <sub>BE(on)</sub>    | Base-Emitter On Voltage              | I <sub>C</sub> = 10A ; V <sub>CE</sub> = 6V                           |     |     | 2.8  | V    |
| I <sub>CBO</sub>       | Collector Cutoff Current             | V <sub>CB</sub> = 600V; I <sub>E</sub> = 0                            |     |     | 1    | mA   |
| I <sub>EBO</sub>       | Emitter Cutoff Current               | V <sub>EB</sub> = 6V; I <sub>C</sub> = 0                              |     |     | 40   | mA   |
| h <sub>FE-1</sub>      | DC Current Gain                      | I <sub>C</sub> = 3A ; V <sub>CE</sub> = 6V                            | 300 |     |      |      |
| h <sub>FE-2</sub>      | DC Current Gain                      | I <sub>C</sub> = 6A ; V <sub>CE</sub> = 6V                            | 100 |     | 2000 |      |
| h <sub>FE-3</sub>      | DC Current Gain                      | I <sub>C</sub> = 10A ; V <sub>CE</sub> = 6V                           | 20  |     |      |      |
| V <sub>ECF</sub>       | C-E Diode Forward Voltage            | I <sub>F</sub> = 10A                                                  |     |     | 3.5  | V    |
| C <sub>OB</sub>        | Output Capacitance                   | V <sub>CB</sub> = 10V, I <sub>E</sub> = 0; f <sub>test</sub> = 100kHz |     |     | 350  | pF   |

### Switching Times

|                |              |                                                                                        |  |  |    |     |
|----------------|--------------|----------------------------------------------------------------------------------------|--|--|----|-----|
| t <sub>s</sub> | Storage Time | V <sub>CC</sub> =12V; I <sub>C</sub> =6A ;<br>I <sub>B1</sub> = I <sub>B2</sub> = 0.3A |  |  | 15 | μ s |
| t <sub>f</sub> | Fall Time    |                                                                                        |  |  | 15 | μ s |