



**Solid State Devices, Inc.**

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## DESIGNER'S DATA SHEET

### Part Number / Ordering Information <sup>1/</sup>

SPT5006

SPT5008

Screening <sup>2/</sup> \_\_\_ = Not Screened

TX = TX Level

TXV = TXV Level

S = S Level

Lead Bend <sup>3/ 4/</sup> \_\_\_ = Straight Leads

UB = Up Bend

DB = Down Bend

Package <sup>3/</sup> /61 = TO-61

/3 = TO-3

M = TO-254

S1 = SMD1

## SPT5006 and SPT5008 Series

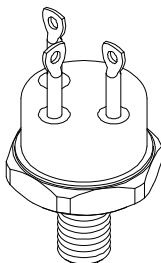
**10 AMPS**  
**100 Volts**  
**High Power - High Speed**  
**NPN Transistors**

### Features:

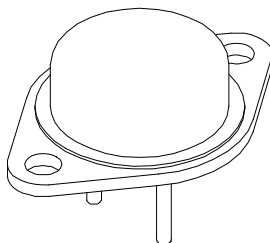
- Radiation Tolerant
- Fast Switching, 100 ns Maximum  $t_d$
- High Frequency,  $f_T > 30\text{MHz}$
- $BV_{CEO}$  80 Volts Minimum
- High Linear Gain, Low Saturation Voltage
- 200°C Operating Temperature
- Designed for Complementary Use With SPT5007 and SPT5009
- TX, TXV, S-Level Screening Available. Consult Factory.

| Maximum Ratings                                                         | Symbol            | Value        | Units         |
|-------------------------------------------------------------------------|-------------------|--------------|---------------|
| Collector – Emitter Voltage                                             | $V_{CEO}$         | 80           | Volts         |
| Collector – Base Voltage                                                | $V_{CBO}$         | 100          | Volts         |
| Emitter – Base Voltage                                                  | $V_{EBO}$         | 6            | Volts         |
| Collector Current                                                       | $I_C$             | 10           | Amps          |
| Base Current                                                            | $I_B$             | 3            | Amps          |
| Total Power Dissipation @ $T_C = 50^\circ\text{C}$<br>Derate Above 50°C | $P_D$             | 100<br>0.667 | Watts<br>W/°C |
| Operating & Storage Temperature                                         | $T_J$ & $T_{STG}$ | -65 to +200  | °C            |
| Maximum Thermal Resistance<br>(Junction to Case)                        | $R_{\theta JC}$   | 1.5          | °C/W          |

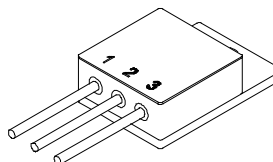
TO-61 (/61)



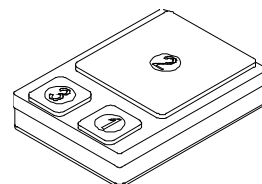
TO-3(/3)



TO-254 (M)



SMD1 (S1)



**NOTE:** All specifications are subject to change without notification.  
SSD's for these devices should be reviewed by SSDI prior to release.

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**DOC**



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## SPT5006 and SPT5008 Series

| Electrical Characteristics             |                                                                                                                                         | Symbol                | Min            | Max | Units  |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------|-----|--------|
| Collector – Emitter Blocking Voltage * | (I <sub>C</sub> = 200 mA)                                                                                                               | BV <sub>CEO</sub>     | 80             | —   | Volts  |
| Collector – Base Blocking Voltage      | (I <sub>C</sub> = 200 μA)                                                                                                               | BV <sub>CBO</sub>     | 100            | —   | Volts  |
| Emitter – Base Blocking Voltage        | (I <sub>E</sub> = 200 μA)                                                                                                               | BV <sub>EBO</sub>     | 6              | —   | Volts  |
| Collector Cutoff Current               | (V <sub>CE</sub> = 40 V)                                                                                                                | I <sub>CEO</sub>      | —              | 50  | μA     |
|                                        | (V <sub>CE</sub> = 60 V)                                                                                                                | I <sub>CES</sub>      | —              | 1.0 | μA     |
| Collector Cutoff Current               | (V <sub>CE</sub> = 100 V)                                                                                                               | I <sub>CEx</sub>      | —              | 1.0 | mA     |
|                                        | (V <sub>CE</sub> = 60 V, V <sub>BE</sub> = 2 V, T <sub>C</sub> = 150°C)                                                                 | I <sub>CEx</sub>      | —              | 500 | μA     |
| Emitter Cutoff Current                 | (V <sub>EB</sub> = 4 V)                                                                                                                 | I <sub>EBO</sub>      | —              | 1.0 | μA     |
|                                        | (V <sub>EB</sub> = 5.5 V)                                                                                                               | I <sub>EBO</sub>      | —              | 1.0 | mA     |
| DC Current Gain *                      | (I <sub>C</sub> = 100 mA, V <sub>CE</sub> = 5 V) 2N5006                                                                                 | h <sub>FE</sub>       | 20             | —   |        |
|                                        | 2N5008                                                                                                                                  |                       | 50             | —   |        |
|                                        | (I <sub>C</sub> = 5 A, V <sub>CE</sub> = 5 V) 2N5006                                                                                    |                       | 30             | 90  |        |
|                                        | 2N5008                                                                                                                                  |                       | 70             | 200 |        |
|                                        | (I <sub>C</sub> = 10 A, V <sub>CE</sub> = 5 V) 2N5006                                                                                   |                       | 20             | —   |        |
|                                        | 2N5008                                                                                                                                  |                       | 45             | —   |        |
| Collector-Emitter Saturation Voltage * | (I <sub>C</sub> = 5 A, I <sub>B</sub> = 500 mA)                                                                                         | V <sub>CE (SAT)</sub> | —              | 0.9 | Volts  |
|                                        | (I <sub>C</sub> = 10 A, I <sub>B</sub> = 500 mA)                                                                                        |                       | —              | 1.5 |        |
| Base-Emitter Saturation Voltage *      | (I <sub>C</sub> = 5 A, I <sub>B</sub> = 500 mA)                                                                                         | V <sub>BE (SAT)</sub> | —              | 1.8 | Volts  |
|                                        | (I <sub>C</sub> = 10 A, I <sub>B</sub> = 1 A)                                                                                           |                       | —              | 2.2 |        |
| Base – Emitter Voltage*                | (V <sub>CE</sub> = 5 V, I <sub>C</sub> = 5 A)                                                                                           | V <sub>BE (ON)</sub>  | —              | 1.8 |        |
| Current Gain – Bandwidth Product       | (V <sub>CE</sub> = 5 V, I <sub>C</sub> = 0.5 A, f = 20 MHz) 2N5006                                                                      | f <sub>T</sub>        | 30             | —   | MHz    |
|                                        | 2N5008                                                                                                                                  |                       | 40             | —   |        |
| Output Capacitance                     | V <sub>CB</sub> = 10 V, I <sub>E</sub> = 0 A, f = 1.0MHz                                                                                | C <sub>ob</sub>       | —              | 275 | pF     |
| Delay Time                             | (V <sub>CC</sub> = 40 V, I <sub>C</sub> = 2 A, V <sub>EB (OFF)</sub> = 3.0 V, I <sub>B1</sub> = I <sub>B2</sub> = 200 mA)<br>(tp = 2μs) | t <sub>(on)</sub>     | t <sub>d</sub> | —   | 100 ns |
| Rise Time                              |                                                                                                                                         | t <sub>(on)</sub>     | t <sub>r</sub> | —   | 100 ns |
| Storage Time                           |                                                                                                                                         | t <sub>(off)</sub>    | t <sub>s</sub> | —   | 2.0 μs |
| Fall Time                              |                                                                                                                                         | t <sub>(off)</sub>    | t <sub>f</sub> | —   | 200 ns |

### NOTES:

\* Pulse Test: Pulse Width = 300μsec, Duty Cycle = 2%

1/ For Ordering Information, Price, and Availability Contact Factory.

2/ Screening based on MIL-PRF-19500. Screening flows are available on request.

3/ For Package Outlines Contact Factory.

4/ Up and Down Bend Configurations are Available for 'M' (TO-254) Packages Only.

5/ Unless Otherwise Specified, All Electrical Characteristics @25°C.

### Available Part Numbers:

SPT5006/61, SPT5006/3, SPT5006M, SPT5006MUB, SPT5006MDB, SPT5006S1,  
SPT5008/61, SPT5008/3, SPT5008M, SPT5008MUB, SPT5008MDB, SPT5008S1

### PIN ASSIGNMENT (Standard)

| Package     | Collector | Emitter | Base  |
|-------------|-----------|---------|-------|
| TO-61 (/61) | Pin 3     | Pin 1   | Pin 2 |
| TO-3 (/3)   | Case      | Pin 2   | Pin 3 |
| TO-254 (M)  | Pin 1     | Pin 2   | Pin 3 |
| SMD1(S1)    | Pin 2     | Pin 1   | Pin 3 |

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