



Solid State Devices Incorporated  
 14830 Valley View Avenue  
 La Mirada, California 90638  
 Telephone (213) 921-9660  
 TWX 910-583-4807

# 2N5303, SPT5303

## 200 WATT

### NPN SILICON

## POWER TRANSISTOR

X00256

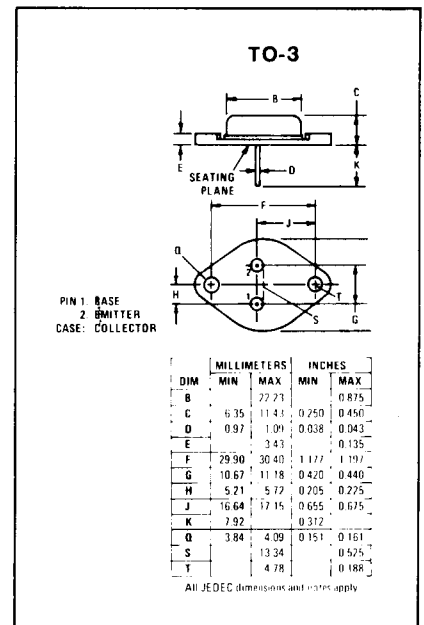
- FEATURES**
- HFE ..... 15–60 @ 10 Amps
  - VCE (sat) ..... 2.0 V @ 20 Amps
  - Fast Switching 1  $\mu$ sec Rise Time
  - Excellent Safe Operating Area

**MAXIMUM RATINGS**

Rating	Symbol	2N5303	SPT5303	Unit
Collector-Emitter Voltage	$V_{CE0}$	80	100	Vdc
Collector-Base Voltage	$V_{CB}$	80	100	Vdc
Emitter-Base Voltage	$V_{EB}$	5	5	Vdc
Collector Current – Continuous	$I_C$	20		Adc
Base Current	$I_B$	7.5		Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	200		Watts
		1.14		W/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200		$^\circ\text{C}$

**PHYSICAL DIMENSIONS**

In accordance with JEDEC ( TO-3 ) outline



**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max.	Unit
Thermal Resistance, Junction to Case	$\theta_{JC}$	.875	$^\circ\text{C}/\text{W}$

**ELECTRICAL CHARACTERISTICS**

Characteristic	Fig. No.	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Sustaining Voltage* ( $I_C = 200 \text{ mAdc}, I_B = 0$ )	2N5303 SPT5303	$BV_{CE0(sus)}$ *	80 100		Vdc
Collector Cutoff Current ( $V_{CE} = 80 \text{ Vdc}, I_B = 0$ ) ( $V_{CE} = 100 \text{ Vdc}, I_B = 0$ )	2N5303 SPT5303	$I_{CEO}$		5 5	mAdc
Collector Cutoff Current ( $V_{CE} = 80 \text{ Vdc}, V_{EB(off)} = 1.5 \text{ Vdc}$ ) ( $V_{CE} = 100 \text{ Vdc}, V_{EB(off)} = 1.5 \text{ Vdc}$ ) ( $V_{CE} = 80 \text{ Vdc}, V_{EB(off)} = 1.5 \text{ Vdc}, T_C = 150^\circ\text{C}$ ) ( $V_{CE} = 100 \text{ Vdc}, V_{EB(off)} = 1.5 \text{ Vdc}, T_C = 150^\circ\text{C}$ )	2N5303 SPT5303 2N5303 SPT5303	$I_{CEX}$		1 1 10 10	mAdc
Collector Cutoff Current ( $V_{CB} = \text{Rated } V_{CB}, I_E = 0$ )	All Types	$I_{CBO}$		1	mAdc
Emitter Cutoff Current ( $V_{BE} = 5 \text{ Vdc}, I_C = 0$ )	All Types	$I_{EBO}$		5	mAdc

# ELECTRICAL CHARACTERISTICS

Characteristic	Fig. No.	Symbol	Min	Max	Unit
----------------	----------	--------	-----	-----	------

## ON CHARACTERISTICS

DC Current Gain* $(I_C = 1000 \text{ mAdc}, V_{CE} = 2 \text{ Vdc})$  $(I_C = 10 \text{ Adc}, V_{CE} = 2 \text{ Vdc})$  $(I_C = 20 \text{ Adc}, V_{CE} = 4 \text{ Vdc})$	All Types	$h_{FE}^*$	40	60	
Collector-Emitter Saturation Voltage* $(I_C = 10 \text{ Adc}, I_B = 1 \text{ Adc})$ $(I_C = 20 \text{ Adc}, I_B = 2 \text{ Adc})$	All Types	$V_{CE(Sat)}^*$		1	Vdc
Base-Emitter Saturation Voltage* $(I_C = 10 \text{ Adc}, I_B = 1 \text{ Adc})$ $(I_C = 20 \text{ Adc}, I_B = 2 \text{ Adc})$	All Types	$V_{BE(Sat)}^*$		1.7	Vdc

## DYNAMIC CHARACTERISTICS

Current-Gain-Bandwidth Product $(I_C = 1000 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 1 \text{ MHz})$	All Types	$f_T$	2		MHz
---	-----------	-------	---	--	-----

## SWITCHING CHARACTERISTICS

Delay Time	$(V_{CC} = 30 \text{ Vdc}$ $I_C = 10 \text{ Adc}, I_{B1} = 1000 \text{ mAdc})$	All Types	$t_r$		1000	ns
Rise Time						
Storage Time	$(V_{CC} = 30 \text{ Vdc}, I_C = 10 \text{ Adc},$ $I_{B1} = I_{B2} = 1000 \text{ mAdc})$	All Types	$t_s$		2	$\mu s$
Fall Time						
			$t_f$		1000	ns

\*Pulse Test: Pulse Width 300  $\mu s$ , Duty Cycle = 2%

## TYPICAL OPERATING CURVES

