



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 μ sec Rise Time
- Excellent Safe Operating Area

MAXIMUM RATINGS

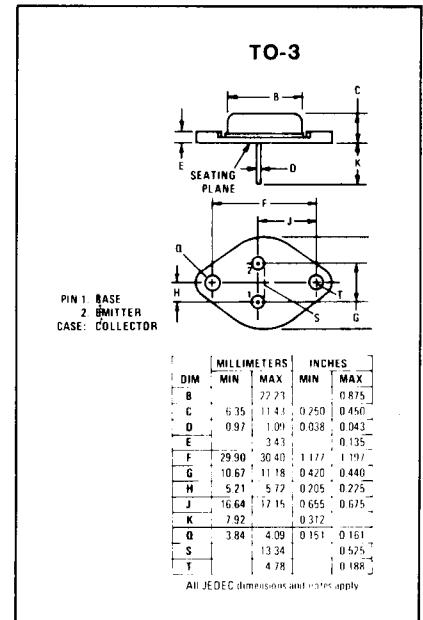
Rating	Symbol	2N5303	SPT5303	Unit
Collector-Emitter Voltage	V_{CE0}	80	100	Vdc
Collector-Base Voltage	V_{CB}	80	100	Vdc
Emitter-Base Voltage	V_{EB}	5	5	Vdc
Collector Current – Continuous	I_C	20		Adc
Base Current	I_B	7.5		Adc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	200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

THERMAL CHARACTERISTICS

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

PHYSICAL DIMENSIONS

In accordance with JEDEC (TO-3) outline



ELECTRICAL CHARACTERISTICS

Characteristic	Fig. No.	Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
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_{CE0}		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_{CB0}		1	mAdc
Emitter Cutoff Current ($V_{BE} = 5 \text{ Vdc}, I_C = 0$)	All Types	I_{EB0}		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 15 5	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 2	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 2.5	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	μs
Fall Time			t_f		1000	ns

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

TYPICAL OPERATING CURVES

