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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 μsec Rise Time
- Excellent Safe Operating Area

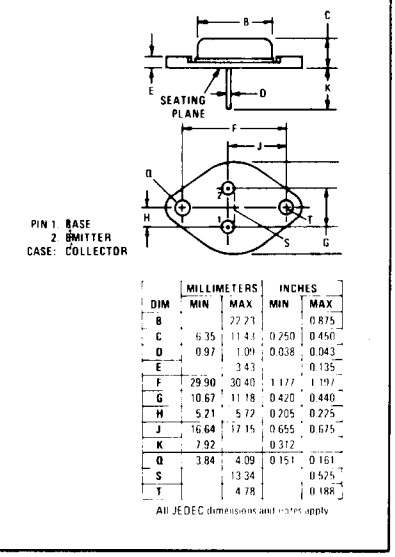
MAXIMUM RATINGS

Rating	Symbol	2N5303	SPT5303	Unit
Collector-Emitter Voltage	V_{CEO}	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°C Derate above 25°C	P_D	200 1.14		Watts W/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		°C

PHYSICAL DIMENSIONS

In accordance with JEDEC (TO-3) outline

TO-3



DIM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX
B		22.23		0.875
C	6.35	11.43	0.250	0.450
D	0.97	1.09	0.038	0.043
E		3.43		0.135
F	29.90	30.40	1.177	1.197
G	10.67	11.18	0.420	0.440
H	5.21	5.72	0.205	0.225
J	16.64	17.15	0.655	0.675
K	7.92		0.312	
Q	3.84	4.09	0.151	0.161
S		13.34		0.525
T		4.78		0.188

All JEDEC dimensions and notes apply

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max.	Unit
Thermal Resistance, Junction to Case	θ_{JC}	.875	°C/W

ELECTRICAL CHARACTERISTICS

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

ELECTRICAL CHARACTERISTICS

Characteristic	Fig. No.	Symbol	Min	Max	Unit
ON CHARACTERISTICS					
DC Current Gain*		h_{FE}*			
(I_C = 1000 mAdc, V_{CE} = 2 Vdc)	All Types		40		
(I_C = 10 Adc, V_{CE} = 2 Vdc)			15	60	
(I_C = 20 Adc, V_{CE} = 4 Vdc)			5		
Collector-Emitter Saturation Voltage*		$V_{CE(Sat)}$*			Vdc
(I_C = 10 Adc, I_B = 1 Adc)	All Types			1	
(I_C = 20 Adc, I_B = 2 Adc)				2	
Base-Emitter Saturation Voltage*		$V_{BE(Sat)}$*			Vdc
(I_C = 10 Adc, I_B = 1 Adc)	All Types			1.7	
(I_C = 20 Adc, I_B = 2 Adc)				2.5	
DYNAMIC CHARACTERISTICS					
Current-Gain-Bandwidth Product (I_C = 1000 mAdc, V_{CE} = 10 Vdc, f = 1 MHz)	All Types	f_T	2		MHz
SWITCHING CHARACTERISTICS					
Delay Time	(V_{CC} = 30 Vdc				
Rise Time	I_C = 10 Adc, I_{B1} = 1000 mAdc)	All Types	t_r	1000	ns
Storage Time	(V_{CC} = 30 Vdc, I_C = 10 Adc,	All Types	t_s	2	μs
Fall Time	I_{B1} = I_{B2} = 1000 mAdc)		t_f	1000	ns

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

TYPICAL OPERATING CURVES