

## NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/466

### Devices

2N5683

2N5684

### Qualified Level

JAN  
JANTX  
JANTXV

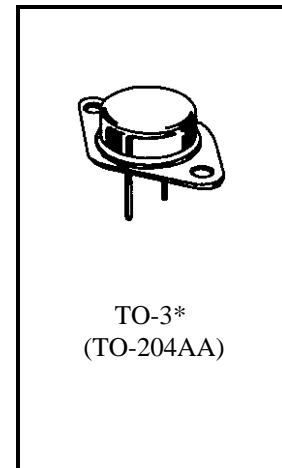
### MAXIMUM RATINGS

Ratings	Symbol	2N5683	2N5684	Unit
Collector-Emitter Voltage	$V_{CEO}$	60	80	Vdc
Collector-Base Voltage	$V_{CBO}$	60	80	Vdc
Emitter-Base Voltage	$V_{EBO}$	5.0		Vdc
Base Current	$I_B$	15		Adc
Collector Current	$I_C$	50		Adc
Total Power Dissipation <sup>(1)</sup>	$P_T$	@ $T_C = 25^{\circ}C$	300	W
		@ $T_C = 100^{\circ}C$	171	W
Operating & Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200		$^{\circ}C$

### THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	0.584	$^{\circ}C/W$

1) Derate linearly 1.715 W/ $^{\circ}C$  between  $T_C = +25^{\circ}C$  and  $T_C = +200^{\circ}C$



\*See appendix A for package outline

### ELECTRICAL CHARACTERISTICS ( $T_C = 25^{\circ}C$ unless otherwise noted)

Characteristics	Symbol	Min.	Max.	Unit
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### OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage $I_C = 200$ mAdc	2N5683 2N5684	$V_{(BR)CEO}$	60 80	Vdc
Collector-Emitter Cutoff Current $V_{CE} = 30$ Vdc $V_{CE} = 40$ Vdc	2N5683 2N5684	$I_{CEO}$	5.0 5.0	$\mu$ Adc
Collector-Emitter Cutoff Current $V_{CE} = 60$ Vdc, $V_{BE} = 1.5$ Vdc $V_{CE} = 80$ Vdc, $V_{BE} = 1.5$ Vdc	2N5683 2N5684	$I_{CEX}$	5.0 5.0	$\mu$ Adc
Collector-Base Cutoff Current $V_{CB} = 60$ Vdc $V_{CB} = 80$ Vdc	2N5683 2N5684	$I_{CBO}$	5.0 5.0	$\mu$ Adc
Emitter-Base Cutoff Current $V_{EB} = 5.0$ Vdc		$I_{EBO}$	5.0	$\mu$ Adc

**ELECTRICAL CHARACTERISTICS (con't)**

Characteristics	Symbol	Min.	Max.	Unit
<b>ON CHARACTERISTICS</b> <sup>(2)</sup>				
Forward-Current Transfer Ratio I <sub>C</sub> = 5.0 Adc, V <sub>CE</sub> = 2.0 Vdc I <sub>C</sub> = 25 Adc, V <sub>CE</sub> = 2.0 Vdc I <sub>C</sub> = 50 Adc, V <sub>CE</sub> = 5.0 Vdc	h <sub>FE</sub>	30 15 5.0	60	
Collector-Emitter Saturation Voltage I <sub>C</sub> = 25 Adc, I <sub>B</sub> = 2.5 Adc I <sub>C</sub> = 50 Adc, I <sub>B</sub> = 10 Adc	V <sub>CE(sat)</sub>		1.0 5.0	Vdc
Base-Emitter Saturation Voltage I <sub>C</sub> = 25 Adc, I <sub>B</sub> = 2.5 Adc	V <sub>BE(sat)</sub>		2.0	Vdc
Base-Emitter Voltage I <sub>C</sub> = 25 Adc, V <sub>CE</sub> = 2.0 Vdc	V <sub>BE(on)</sub>		2.0	Vdc

**DYNAMIC CHARACTERISTICS**

Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio I <sub>C</sub> = 5.0 Adc, V <sub>CE</sub> = 10 Vdc, f = 1.0 MHz	h <sub>fe</sub>	2.0	20	
Small-Signal Short-Circuit Forward Current Transfer Ratio I <sub>C</sub> = 10 Adc, V <sub>CE</sub> = 5.0 Vdc, f = 1.0 kHz	h <sub>fe</sub>	15		
Output Capacitance V <sub>CB</sub> = 10 Vdc, I <sub>E</sub> = 0, 0.1 MHz ≤ f ≤ 1.0 MHz	C <sub>obo</sub>		2,000	pF

**SWITCHING CHARACTERISTICS**

Turn-On Time V <sub>CC</sub> = 30 Vdc; I <sub>C</sub> = 25 Adc; I <sub>B</sub> = 2.5 Adc	t <sub>on</sub>		1.5	μs
Turn-Off Time V <sub>CC</sub> = 30 Vdc; I <sub>C</sub> = 25 Adc; I <sub>B1</sub> = I <sub>B2</sub> = 2.5 Adc	t <sub>off</sub>		3.0	μs

**SAFE OPERATING AREA**

<b>DC Tests</b> T <sub>C</sub> = +25 <sup>0</sup> C, 1 Cycle, t = 1.0 s	
<b>Test 1</b> V <sub>CE</sub> = 6.0 Vdc, I <sub>C</sub> = 50 Adc	All Types
<b>Test 2</b> V <sub>CE</sub> = 30 Vdc, I <sub>C</sub> = 10 Adc	All Types
<b>Test 3</b> V <sub>CE</sub> = 50 Vdc, I <sub>C</sub> = 560 mAcd	2N5683
V <sub>CE</sub> = 60 Vdc, I <sub>C</sub> = 640 mAcd	2N5684

(2) Pulse Test: Pulse Width = 300μs, Duty Cycle ≤ 2.0%.