



TECHNICAL DATA

NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/466

Devices

2N5683

2N5684

Qualified Level

JAN
JANTX
JANTXV

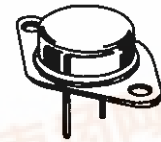
MAXIMUM RATINGS

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 ⁽¹⁾	@ $T_C = 25^\circ\text{C}$ @ $T_C = 100^\circ\text{C}$	300		W
		171		W
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		$^\circ\text{C}$

THERMAL CHARACTERISTICS

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

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



TO-3*
(TO-204AA)

*See appendix A for package outline

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

Characteristics	Symbol	Min.	Max.	Unit
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OFF CHARACTERISTICS

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



ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
ON CHARACTERISTICS ⁽²⁾				
Forward-Current Transfer Ratio I _C = 5.0 Adc, V _{CE} = 2.0 Vdc I _C = 25 Adc, V _{CE} = 2.0 Vdc I _C = 50 Adc, V _{CE} = 5.0 Vdc	h _{FE}	30 15 5.0	60	
Collector-Emitter Saturation Voltage I _C = 25 Adc, I _B = 2.5 Adc I _C = 50 Adc, I _B = 10 Adc	V _{CE(sat)}		1.0 5.0	Vdc
Base-Emitter Saturation Voltage I _C = 25 Adc, I _B = 2.5 Adc	V _{BE(sat)}		2.0	Vdc
Base-Emitter Voltage I _C = 25 Adc, V _{CE} = 2.0 Vdc	V _{BE(on)}		2.0	Vdc

DYNAMIC CHARACTERISTICS

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

SWITCHING CHARACTERISTICS

Turn-On Time V _{CC} = 30 Vdc; I _C = 25 Adc; I _B = 2.5 Adc	t _{on}		1.5	μs
Turn-Off Time V _{CC} = 30 Vdc; I _C = 25 Adc; I _{B1} = I _{B2} = 2.5 Adc	t _{off}		3.0	μs

SAFE OPERATING AREA

DC Tests T _C = +25°C, 1 Cycle, t = 1.0 s				
Test 1 V _{CE} = 6.0 Vdc, I _C = 50 Adc	All Types			
Test 2 V _{CE} = 30 Vdc, I _C = 10 Adc	All Types			
Test 3 V _{CE} = 50 Vdc, I _C = 560 mAdc	2N5683			
V _{CE} = 60 Vdc, I _C = 640 mAdc	2N5684			

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