

## NPN HIGH POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/384

### Devices

2N3584

2N3585

### Qualified Level

JAN  
JANTX  
JANTXV

### MAXIMUM RATINGS

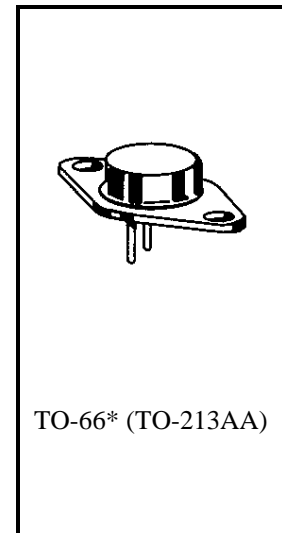
Ratings	Symbol	2N3584	2N3585	Units
Collector-Emitter Voltage	$V_{CEO}$	250	300	Vdc
Collector-Base Voltage	$V_{CBO}$	375	500	Vdc
Collector-Base Voltage	$V_{CER}$	300	400	Vdc
Emitter-Base Voltage	$V_{EBO}$	6.0		Vdc
Base Current	$I_B$	1.0		Adc
Collector Current	$I_C$	2.0		Adc
Total Power Dissipation		@ $T_A = +25^{\circ}\text{C}$ <sup>(1)</sup>	2.5	W
		@ $T_C = +25^{\circ}\text{C}$ <sup>(2)</sup>	35	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	$R_{\theta JC}$	5.0	$^{\circ}\text{C}/\text{W}$

1) Derate linearly @ 14.85 mW/ $^{\circ}\text{C}$  for  $T_A > +25^{\circ}\text{C}$

2) Derate linearly @ 200 mW/ $^{\circ}\text{C}$  for  $T_C > +25^{\circ}\text{C}$



\*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 $I_C = 10 \text{ mAdc}$	2N3584 2N3585	$V_{(BR)CEO}$	250 300	Vdc
Collector-Base Breakdown Voltage $I_C = 15 \text{ mAdc}$	2N3584 2N3585	$V_{(BR)CER}$	375 500	Vdc
Collector-Emitter Cutoff Current $V_{CE} = 150 \text{ Vdc}$		$I_{CEO}$	5.0	mAdc
Collector-Emitter Cutoff Current $V_{CE} = 300 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$ $V_{CE} = 400 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$	2N3584 2N3585	$I_{CEX}$	1.0 1.0	mAdc
	Emitter-Base Cutoff Current $V_{EB} = 6.0 \text{ Vdc}$		$I_{EBO}$	

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**ELECTRICAL CHARACTERISTICS (con't)**

Characteristics	Symbol	Min.	Max.	Unit
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**ON CHARACTERISTICS** <sup>(3)</sup>

Forward-Current Transfer Ratio $I_C = 1.0 \text{ Adc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 100 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$	$h_{FE}$	25 40	100	
Collector-Emitter Saturation Voltage $I_C = 1.0 \text{ Adc}, I_B = 0.125 \text{ Adc}$	$V_{CE(sat)}$		0.75	Vdc
Base-Emitter Saturation Voltage $I_C = 1.0 \text{ Adc}, I_B = 0.1 \text{ Adc}$	$V_{BE(sat)}$		1.4	Vdc

**DYNAMIC CHARACTERISTICS**

Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 200 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 5.0 \text{ MHz}$	$ h_{fe} $	3.0	15	
Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 1.0 \text{ Adc}, V_{CE} = 10 \text{ Vdc}, f = 1.0 \text{ kHz}$	$h_{fe}$	25	200	
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	$C_{obo}$		120	pF

**SWITCHING CHARACTERISTICS**

Turn-On Time $V_{CC} = 30 \text{ Vdc}; I_C = 1.0 \text{ Adc}; I_B = 100 \text{ mAdc}; R_C = 29 \Omega$	$t_{on}$		3.0	$\mu\text{s}$
Turn-Off Time $V_{CC} = 30 \text{ Vdc}; I_C = 1.0 \text{ Adc}; I_B = -I_B = 100 \text{ mAdc}; R_C = 29 \Omega$	$t_{off}$		7.0	$\mu\text{s}$

**SAFE OPERATING AREA**

<b>DC Tests</b>				
$T_C = +25^\circ\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s}$				
<b>Test 1</b>				
$V_{CE} = 17.5 \text{ Vdc}, I_C = 2.0 \text{ Adc}$				
<b>Test 2</b>				
$V_{CE} = 100 \text{ Vdc}, I_C = 350 \text{ mAdc}$				
<b>Test 3</b>				
$V_{CE} = 250 \text{ Vdc}, I_C = 37 \text{ mAdc}$				2N3584
$V_{CE} = 300 \text{ Vdc}, I_C = 17 \text{ mAdc}$				2N3585

(3) Pulse Test: Pulse Width = 300 $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .