

## NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/525

### Devices

2N6546

2N6547

### Qualified Level

JAN  
JANTX  
JANTXV

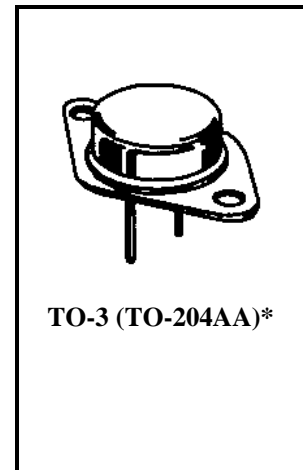
### MAXIMUM RATINGS

Ratings	Symbol	2N6546	2N6547	Units
Collector-Emitter Voltage	$V_{CEO}$	300	400	Vdc
Collector-Base Voltage	$V_{CEX}$	600	850	Vdc
Emitter-Base Voltage	$V_{EBO}$	8		Vdc
Base Current	$I_B$	10		Adc
Collector Current	$I_C$	15		Adc
Total Power Dissipation	$P_T$	@ $T_C = +25^{\circ}\text{C}$ <sup>(1)</sup>	175	W
		@ $T_C = +100^{\circ}\text{C}$ <sup>(1)</sup>	100	W
Operating & Storage Temperature Range	$T_{op}, T_{stg}$	-65 to +200		$^{\circ}\text{C}$

### THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	1.0	$^{\circ}\text{C}/\text{W}$

1) Between  $T_C = +25^{\circ}\text{C}$  and  $T_C = +200^{\circ}\text{C}$ , linear derating factor (average) = 1.0 W/ $^{\circ}\text{C}$



\*See Appendix A for Package Outline

### ELECTRICAL CHARACTERISTICS

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

Collector-Emitter Breakdown Voltage $I_C = 100 \text{ mAdc}$	2N6546 2N6547	$V_{(BR)CEO}$	300 400	Vdc
Collector-Emitter Cutoff Current $V_{CE} = 600 \text{ Vdc}; V_{BE} = 1.5 \text{ Vdc}$ $V_{CE} = 850 \text{ Vdc}; V_{BE} = 1.5 \text{ Vdc}$	2N6546 2N6547	$I_{CEX}$	1.0 1.0	mAdc
Emitter-Base Cutoff Current $V_{EB} = 8 \text{ Vdc}$		$I_{EBO}$	1.0	mAdc

**2N6546, 2N6547 JAN SERIES**

**ELECTRICAL CHARACTERISTICS (con't)**

Characteristics	Symbol	Min.	Max.	Unit
<b>ON CHARACTERISTICS<sup>(3)</sup></b>				
Forward-Current Transfer Ratio I <sub>C</sub> = 1 Adc; V <sub>CE</sub> = 2 Vdc I <sub>C</sub> = 5 Adc; V <sub>CE</sub> = 2 Vdc I <sub>C</sub> = 10 Adc; V <sub>CE</sub> = 2 Vdc	h <sub>FE</sub>	15 12 6	60	
Base-Emitter Saturated Voltage I <sub>B</sub> = 2.0 Adc; I <sub>C</sub> = 10 Adc	V <sub>BE(sat)</sub>		1.6	Vdc
Collector-Emitter Saturated Voltage I <sub>B</sub> = 2.0 Adc; I <sub>C</sub> = 10 Adc I <sub>B</sub> = 3.0 Adc; I <sub>C</sub> = 15 Adc	V <sub>CE(sat)</sub>		1.5 5.0	Vdc

**DYNAMIC CHARACTERISTICS**

Magnitude of Common-Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio I <sub>C</sub> = 0.5 Adc, V <sub>CE</sub> = 10 Vdc, f = 1 MHz	h <sub>fe</sub>	6.0	30	
Output Capacitance V <sub>CB</sub> = 10 Vdc, I <sub>E</sub> = 0, 0.1 MHz ≤ f ≤ 1.0 MHz	C <sub>obo</sub>		500	pF

**SWITCHING CHARACTERISTICS**

Turn-On Time V <sub>CC</sub> = 250 Vdc; I <sub>C</sub> = 10 Adc; I <sub>B1</sub> = I <sub>B2</sub> = 2 Adc	t <sub>on</sub>		1.0	μs
Turn-Off Time V <sub>CC</sub> = 250 Vdc; I <sub>C</sub> = 10 Adc; I <sub>B1</sub> = I <sub>B2</sub> = 2 Adc	t <sub>off</sub>		4.7	μs

**SAFE OPERATING AREA**

<b>DC Tests</b>	
T <sub>C</sub> = +25°C; t <sub>p</sub> = 1 s; 1 cycle (See Figure 3 of MIL-PRF-19500/525)	
<b>Test 1</b>	
V <sub>CE</sub> = 11.7 Vdc; I <sub>C</sub> = 15 Adc	
<b>Test 2</b>	
V <sub>CE</sub> = 20 Vdc; I <sub>C</sub> = 8.75 Adc	
<b>Test 3</b>	
V <sub>CE</sub> = 250 Vdc; I <sub>C</sub> = 45 mAdc	2N6546
V <sub>CE</sub> = 350 Vdc; I <sub>C</sub> = 30 mAdc	2N6547
<b>Unclamped Inductive IOAD</b>	
T <sub>C</sub> = +25°C; duty cycle ≤ 10%; R <sub>S</sub> = 0.1 Ω; t <sub>r</sub> = t <sub>f</sub> ≤ 500 ns (See Figure 4 of MIL-PRF-19500/525)	
<b>Test 1</b>	
T <sub>p</sub> = 5 ms; (vary to obtain I <sub>C</sub> ); R <sub>BB1</sub> = 15 Ω; V <sub>BB1</sub> = 38.5 Vdc; R <sub>BB2</sub> = 50 Ω; V <sub>BB2</sub> = -4 Vdc; V <sub>CC</sub> = 20 Vdc; I <sub>C</sub> = 15 Adc; L = 10 μH	
<b>Test 2</b>	
T <sub>p</sub> = 5 ms; (vary to obtain I <sub>C</sub> ); R <sub>BB1</sub> = 15 Ω; V <sub>BB1</sub> = 38.5 Vdc; R <sub>BB2</sub> = 50 Ω; V <sub>BB2</sub> = -4 Vdc; V <sub>CC</sub> = 20 Vdc; I <sub>C</sub> = 100 mAdc; L = 1 mH	
<b>Clamped Inductive Load</b>	
T <sub>A</sub> = +25°C; duty cycle ≤ 5%; T <sub>p</sub> = 1.5 ms; (vary to obtain I <sub>C</sub> ); V <sub>CC</sub> = 20 Vdc; I <sub>C</sub> = 8 Adc; L = 180 μH (See Figure 5 of MIL-PRF-19500/525)	
Clamped Voltage = 350 Vdc	2N6546
Clamped Voltage = 450 Vdc	2N6547

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