

NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/525

Devices

2N6546

2N6547

Qualified Level

JAN
JANTX
JANTXV

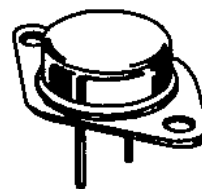
MAXIMUM RATINGS

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	@ $T_C = +25^{\circ}\text{C}$ ⁽¹⁾		W
		@ $T_C = +100^{\circ}\text{C}$ ⁽¹⁾		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	$^{\circ}\text{C/W}$

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



TO-3 (TO-204AA)*

*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	$V_{(BR)CEO}$	300	Vdc
	2N6547		400	
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	I_{CEX}	1.0	mAdc
	2N6547		1.0	
Emitter-Base Cutoff Current $V_{EB} = 8 \text{ Vdc}$		I_{EBO}	1.0	mAdc

6 Lake Street, Lawrence, MA 01841

1-800-446-1158 / (978) 794-1666 / Fax: (978) 689-0803

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Page 1 of 2

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
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ON CHARACTERISTICS⁽³⁾

Forward-Current Transfer Ratio $I_C = 1 \text{ Adc}; V_{CE} = 2 \text{ Vdc}$ $I_C = 5 \text{ Adc}; V_{CE} = 2 \text{ Vdc}$ $I_C = 10 \text{ Adc}; V_{CE} = 2 \text{ Vdc}$	h_{FE}	15 12 6	60	
Base-Emitter Saturated Voltage $I_B = 2.0 \text{ Adc}; I_C = 10 \text{ Adc}$	$V_{BE(sat)}$		1.6	Vdc
Collector-Emitter Saturated Voltage $I_B = 2.0 \text{ Adc}; I_C = 10 \text{ Adc}$ $I_B = 3.0 \text{ Adc}; I_C = 15 \text{ Adc}$	$V_{CE(sat)}$		1.5 5.0	Vdc

DYNAMIC CHARACTERISTICS

Magnitude of Common-Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 0.5 \text{ Adc}; V_{CE} = 10 \text{ Vdc}; f = 1 \text{ MHz}$	$ h_{fe} $	6.0	30	
Output Capacitance $V_{CB} = 10 \text{ Vdc}; I_E = 0; 0.1 \text{ MHz} \leq f \leq 1.0 \text{ MHz}$	C_{obo}		500	pF

SWITCHING CHARACTERISTICS

Turn-On Time $V_{CC} = 250 \text{ Vdc}; I_C = 10 \text{ Adc}; I_{B1} = I_{B2} = 2 \text{ Adc}$	t_{on}		1.0	μs
Turn-Off Time $V_{CC} = 250 \text{ Vdc}; I_C = 10 \text{ Adc}; I_{B1} = I_{B2} = 2 \text{ Adc}$	t_{off}		4.7	μs

SAFE OPERATING AREA**DC Tests**

$T_C = +25^\circ\text{C}; t_p = 1 \text{ s}; 1 \text{ cycle}$ (See Figure 3 of MIL-PRF-19500/525)

Test 1

$V_{CE} = 11.7 \text{ Vdc}; I_C = 15 \text{ Adc}$

Test 2

$V_{CE} = 20 \text{ Vdc}; I_C = 8.75 \text{ Adc}$

Test 3

$V_{CE} = 250 \text{ Vdc}; I_C = 45 \text{ mAdc}$ 2N6546

$V_{CE} = 350 \text{ Vdc}; I_C = 30 \text{ mAdc}$ 2N6547

Unclamped Inductive IOAD

$T_C = +25^\circ\text{C}; \text{duty cycle} \leq 10\%; R_S = 0.1 \Omega; t_r = t_f \leq 500 \text{ ns}$ (See Figure 4 of MIL-PRF-19500/525)

Test 1

$T_p = 5 \text{ ms}; (\text{vary to obtain } I_C); R_{BB1} = 15 \Omega; V_{BB1} = 38.5 \text{ Vdc}; R_{BB2} = 50 \Omega;$

$V_{BB2} = -4 \text{ Vdc}; V_{CC} = 20 \text{ Vdc}; I_C = 15 \text{ Adc}; L = 10 \mu\text{H}$

Test 2

$T_p = 5 \text{ ms}; (\text{vary to obtain } I_C); R_{BB1} = 15 \Omega; V_{BB1} = 38.5 \text{ Vdc}; R_{BB2} = 50 \Omega;$

$V_{BB2} = -4 \text{ Vdc}; V_{CC} = 20 \text{ Vdc}; I_C = 100 \text{ mAdc}; L = 1 \text{ mH}$

Clamped Inductive Load

$T_A = +25^\circ\text{C}; \text{duty cycle} \leq 5\%; T_p = 1.5 \text{ ms}; (\text{vary to obtain } I_C); V_{CC} = 20 \text{ Vdc}; I_C = 8 \text{ Adc}; L = 180 \mu\text{H}$
(See Figure 5 of MIL-PRF-19500/525)

Clamped Voltage = 350 Vdc 2N6546

Clamped Voltage = 450 Vdc 2N6547

3.) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.