

NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/407

Devices

2N3055

Qualified Level

JAN
JANTX

MAXIMUM RATINGS

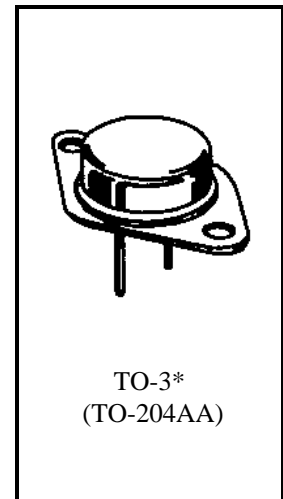
Ratings	Symbol	Value	Units	
Collector-Emitter Voltage	V_{CEO}	70	Vdc	
Collector-Base Voltage	V_{CBO}	100	Vdc	
Emitter-Base Voltage	V_{EBO}	7.0	Vdc	
Base Current	I_B	7.0	Adc	
Collector Current	I_C	15	Adc	
Total Power Dissipation	P_T	@ $T_A = 25^{\circ}\text{C}$ ⁽¹⁾	6.0	W
		@ $T_C = 25^{\circ}\text{C}$ ⁽²⁾	117	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	$R_{\theta JC}$	1.5	$^{\circ}\text{C}/\text{W}$

1) Derate linearly @ 34.2 mW/ $^{\circ}\text{C}$ for $T_A > +25^{\circ}\text{C}$

2) Derate linearly @ 668 mW/ $^{\circ}\text{C}$ for $T_C > +25^{\circ}\text{C}$



*See Appendix A for Package Outline

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min.	Max.	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}$	$V_{(BR)CEO}$	70		Vdc
Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}, R_{BE} = 100\Omega$	$V_{(BR)CER}$	80		Vdc
Collector-Emitter Breakdown Voltage $V_{BE} = -1.5 \text{ Vdc}, I_C = 200 \text{ mAdc}$	$V_{(BR)CEX}$	90		Vdc
Collector-Emitter Cutoff Current $V_{CE} = 60 \text{ Vdc}$	I_{CEO}		1.0	mAdc
Collector-Emitter Cutoff Current $V_{BE} = -1.5 \text{ Vdc}; V_{CE} = 100 \text{ Vdc}$	I_{CEX}		1.0	mAdc
Emitter-Base Cutoff Current $V_{EB} = 7.0 \text{ Vdc}$	I_{EBO}		1.0	mAdc

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
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ON CHARACTERISTICS

Forward-Current Transfer Ratio I _C = 0.5 Adc, V _{CE} = 4.0 Vdc I _C = 4.0 Adc, V _{CE} = 4.0 Vdc I _C = 10 Adc, V _{CE} = 4.0 Vdc	h _{FE}	40 20 5.0	60	
Collector-Emitter Saturation Voltage I _C = 4.0 Adc, I _B = 0.4 Adc I _C = 10 Adc, I _B = 3.3 Adc	V _{CE(sat)}		0.75 2.0	Vdc
Base-Emitter Saturation Voltage I _C = 4.0 Adc, V _{CE} = 4.0 Vdc	V _{BE(sat)}		1.4	Vdc

DYNAMIC CHARACTERISTICS

Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio I _C = 4.0 Adc, V _{CE} = 4.0 Vdc, f = 100 kHz	h _{fe}	8.0	40	
Output Capacitance V _{CB} = 10 Vdc, I _E = 0, 100 kHz ≤ f ≤ 1.0 MHz	C _{obo}		700	pF

SWITCHING CHARACTERISTICS

Turn-On Time V _{CC} = 30 Vdc; I _C = 4.0 Adc; I _{B1} = 0.4 Adc	t _{on}		6.0	μs
Turn-Off Time V _{CC} = 30 Vdc; I _C = 4.0 Adc; I _{B1} = -I _{B2} = 0.4 Adc	t _{off}		12	μs

SAFE OPERATING AREA

<p>DC Tests T_C = +25°C, 1 Cycle, t = 1.0 s</p> <p>Test 1 V_{CE} = 7.8 Vdc, I_C = 15 Adc</p> <p>Test 2 V_{CE} = 70 Vdc, I_C = 1.67 Adc</p> <p>Switching Tests T_A = +25°C; duty cycle ≤ 10%; R_S ≤ 0.1 Ω</p> <p>Test 1 t_P = 5.0 ms; R_{BB1} = 2.0 Ω; V_{BB1} ≥ 10 Vdc; R_{BB2} = 100 Ω; V_{CC} ≥ 10 Vdc; V_{BB2} = 1.5 Vdc; I_C = 15 Adc</p> <p>Test 2 t_P = 20 ms; R_{BB1} = 30 Ω; V_{BB1} ≥ 10 Vdc; R_{BB2} = 100 Ω; V_{CC} ≥ 10 Vdc; V_{BB2} = 1.5 Vdc; I_C = 3.8 Adc</p>
