

NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/402

Devices

2N3739

Qualified Level

JANTX
JANTXV

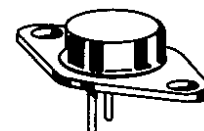
MAXIMUM RATINGS

Ratings	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	300	Vdc
Collector-Base Voltage	V_{CBO}	325	Vdc
Emitter-Base Voltage	V_{EBO}	6.0	Vdc
Base Current	I_B	0.5	Adc
Collector Current	I_C	1.0	Adc
Total Power Dissipation @ $T_C = 25^{\circ}\text{C}$	P_T	20	W
@ $T_C = 100^{\circ}\text{C}$		10	W
Operating & Storage Junction Temperature Range	T_J, T_{stg}	-55 to +200	$^{\circ}\text{C}$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	7.5	$^{\circ}\text{C/W}$

- 1) Derate linearly 0.114 W/ $^{\circ}\text{C}$ for $T_C \geq 25^{\circ}\text{C}$
- 2) Derate linearly 0.100 mW/ $^{\circ}\text{C}$ for $T_C \geq 100^{\circ}\text{C}$



TO-66 (TO-213AA)

*See Appendix A for
Package Outline

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

Characteristics	Symbol	Min.	Max.	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage $I_C = 5.0 \text{ mAdc}$	$V_{(BR)CEO}$	300		Vdc
Emitter-Base Cutoff Current $V_{EB} = 6.0 \text{ Vdc}$	I_{EBO}		0.1	mAdc
Collector-Emitter Cutoff Current $V_{CE} = 325 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$	I_{CEX}		0.5	mAdc
Collector-Base Cutoff Current $V_{CB} = 325 \text{ Vdc}$	I_{CBO}		0.1	mAdc

ELECTRICAL CHARACTERISTICS (con't)

Characteristics	Symbol	Min.	Max.	Unit
ON CHARACTERISTICS ⁽³⁾				
Forward-Current Transfer Ratio $I_C = 10 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 50 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 100 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 250 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$ $I_C = 500 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$	h_{FE}	30 30 40 25 10	200	
Collector-Emitter Saturation Voltage $I_C = 100 \text{ mAdc}, I_B = 10 \text{ mAdc}$ $I_C = 250 \text{ mAdc}, I_B = 25 \text{ mAdc}$	$V_{CE(sat)}$		0.75 2.5	Vdc
Base-Emitter Voltage $I_C = 100 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}$	V_{BE}		1.0	Vdc

DYNAMIC CHARACTERISTICS

Magnitude of Common Emitter Small-Signal Short Circuit Forward Current Transfer Ratio $I_C = 100 \text{ mAdc}, V_{CE} = 10 \text{ Vdc}, f = 10 \text{ MHz}$	$ h_{FE} $	1.0	6.0	
Forward Current Transfer Ratio $I_C = 100 \text{ mAdc}, V_{CE} = 20 \text{ Vdc}$	h_{fe}	35	300	
Output Capacitance $V_{CB} = 100 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	C_{obo}		20	pF

SWITCHING CHARACTERISTICS

Turn-On Time $V_{CC} = 150 \text{ Vdc}; I_C = 500 \text{ mAdc}, I_B = 50 \text{ mAdc}$	t_{on}		1.5	μs
Turn-Off Time $V_{CC} = 150 \text{ Vdc}; I_C = 500 \text{ mAdc}, I_{B1} = I_{B2} = 50 \text{ mAdc}$	t_{off}		3.5	μs

SAFE OPERATING AREA

DC Tests $T_C = 25^\circ\text{C}; t = 1.0 \text{ s}; 1 \text{ cycle}$ Test 1 $V_{CE} = 80 \text{ Vdc}, I_C = 250 \text{ mAdc}$ Test 2 $V_{CE} = 290 \text{ Vdc}, I_C = 6.0 \text{ mAdc}$
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(3) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.