

NPN POWER SILICON SWITCHING TRANSISTOR
Qualified per MIL-PRF-19500/560
Devices
2N5339
Qualified Level
**JANTX
JANTXV**
MAXIMUM RATINGS

Ratings	Symbol	Value	Units
Collector-Emitter Voltage	V_{CEO}	100	Vdc
Collector-Base Voltage	V_{CBO}	100	Vdc
Emitter-Base Voltage	V_{EBO}	6.0	Vdc
Base Current	I_B	1.0	Adc
Collector Current	I_C	5.0	Adc
Total Power Dissipation @ $T_A = +25^{\circ}\text{C}$ ⁽¹⁾	P_T	1.0	W
@ $T_C = +25^{\circ}\text{C}$ ⁽²⁾		10	W
Operating & Storage Junction Temperature Range	T_{op}, T_{stg}	-55 to +200	$^{\circ}\text{C}$

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max.	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	17.5	$^{\circ}\text{C/W}$

1) Derate linearly 5.71 mW/ $^{\circ}\text{C}$ for $T_A > 25^{\circ}\text{C}$

2) Derate linearly 57.1 mW/ $^{\circ}\text{C}$ for $T_C > 25^{\circ}\text{C}$

**TO-39*
(TO-205AD)**

*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 $I_C = 50 \text{ mAdc}$	$V_{(BR)CEO}$	100		Vdc
Collector-Emitter Cutoff Current $V_{CE} = 100 \text{ Vdc}$	I_{CEO}		100	μAdc
Collector-Emitter Cutoff Current $V_{CE} = 90 \text{ Vdc}, V_{BE} = 1.5 \text{ Vdc}$	I_{CEX}		10	μAdc
Collector-Base Cutoff Current $V_{CB} = 100 \text{ Vdc}$	I_{CBO}		10	μAdc
Emitter-Base Cutoff Current $V_{EB} = 6.0 \text{ Vdc}$	I_{EBO}		100	μAdc

ELECTRICAL CHARACTERISTICS (con't)

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

Forward-Current Transfer Ratio $I_C = 0.5 \text{ Adc}, V_{CE} = 2.0 \text{ Vdc}$ $I_C = 2.0 \text{ Adc}, V_{CE} = 2.0 \text{ Vdc}$ $I_C = 5.0 \text{ Adc}, V_{CE} = 2.0 \text{ Vdc}$	h_{FE}	60 60 40	240	
Collector-Emitter Saturation Voltage $I_C = 2.0 \text{ Adc}, I_B = 0.2 \text{ Adc}$ $I_C = 5.0 \text{ Adc}, I_B = 0.5 \text{ Adc}$	$V_{CE(sat)}$		0.7 1.2	Vdc
Base-Emitter Saturation Voltage $I_C = 2.0 \text{ Adc}, I_B = 0.2 \text{ Adc}$ $I_C = 5.0 \text{ Adc}, I_B = 0.5 \text{ Adc}$	$V_{BE(sat)}$		1.2 1.8	Vdc

DYNAMIC CHARACTERISTICS

Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 0.5 \text{ Adc}, V_{CE} = 10 \text{ Vdc}, f = 10 \text{ MHz}$	$ h_{fe} $	3.0	15	
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	C_{obo}		250	pF
Input Capacitance $V_{BE} = 2.0 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	C_{ibo}		1,000	pF

SAFE OPERATING AREA**DC Tests** $T_C = +25^\circ\text{C}, 1 \text{ Cycle}, t \geq 0.5 \text{ s}$ **Test 1** $V_{CE} = 2.0 \text{ Vdc}, I_C = 5.0 \text{ Adc}$ **Test 2** $V_{CE} = 5.0 \text{ Vdc}, I_C = 2.0 \text{ Adc}$ **Test 3** $V_{CE} = 90 \text{ Vdc}, I_C = 55 \text{ mAdc}$ (3) Pulse Test: Pulse Width = 300 μ s, Duty Cycle $\leq$ 2.0%.