

## NPN POWER SILICON TRANSISTOR

Qualified per MIL-PRF-19500/528

### Devices

2N6032

2N6033

### Qualified Level

JANTX  
JANTXV

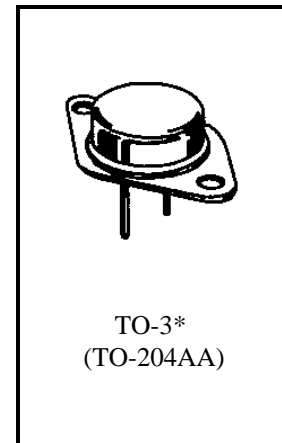
### MAXIMUM RATINGS

Ratings	Symbol	2N6032	2N6033	Units
Collector-Emitter Voltage	$V_{CEO}$	90	120	Vdc
Collector-Base Voltage	$V_{CBO}$	120	150	Vdc
Collector Current	$I_C$	50	40	Adc
Emitter-Base Voltage	$V_{EBO}$	7.0		Vdc
Base Current	$I_B$	10		Adc
Total Power Dissipation @ $T_C = +25^{\circ}\text{C}$ <sup>(1)</sup>	$P_T$	140		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	$R_{\theta JC}$	1.25	$^{\circ}\text{C}/\text{W}$

1) Derate linearly 800 mW/ $^{\circ}\text{C}$  between  $T_C = 25^{\circ}\text{C}$  and  $T_C = 200^{\circ}\text{C}$



\*See appendix A for package outline

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

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

Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}$	2N6032 2N6033	$V_{(BR)CEO}$	90 120	Vdc
Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}$	2N6032 2N6033	$V_{(BR)CER}$	110 140	Vdc
Collector-Emitter Breakdown Voltage $I_C = 200 \text{ mAdc}, V_{EB} = 1.5 \text{ Vdc}$	2N6032 2N6033	$V_{(BR)CEX}$	120 150	Vdc
Collector-Base Cutoff Current $V_{CB} = 120 \text{ Vdc}$ $V_{CB} = 150 \text{ Vdc}$	2N6032 2N6033	$I_{CBO}$	25 25	mAdc
Collector-Emitter Cutoff Current $V_{CE} = 110 \text{ Vdc}, V_{BE} = -1.5 \text{ Vdc}$ $V_{CE} = 135 \text{ Vdc}, V_{BE} = -1.5 \text{ Vdc}$	2N6032 2N6033	$I_{CEX}$	12 10	mAdc

**2N6032, 2N6033, JAN SERIES**

**ELECTRICAL CHARACTERISTICS (con't)**

Characteristics	Symbol	Min.	Max.	Unit
<b>OFF CHARACTERISTICS (con't)</b>				
Emitter-Base Cutoff Current $V_{EB} = 7.0 \text{ Vdc}$	$I_{EBO}$		10	mAdc
Collector-Emitter Cutoff Current $V_{CE} = 80 \text{ Vdc}$	$I_{CEO}$		10	mAdc

**ON CHARACTERISTICS <sup>(2)</sup>**

Forward-Current Transfer Ratio $I_C = 50 \text{ Adc}, V_{CE} = 2.6 \text{ Vdc}$ $I_C = 40 \text{ Adc}, V_{CE} = 2.0 \text{ Vdc}$	2N6032 2N6033	$h_{FE}$	10 10	50 50	
Collector-Emitter Saturation Voltage $I_C = 50 \text{ Adc}, I_B = 5.0 \text{ Adc}$ $I_C = 40 \text{ Adc}, I_B = 4.0 \text{ Adc}$	2N6032 2N6033	$V_{CE(sat)}$		1.3 1.0	Vdc
Base-Emitter Saturation Voltage $I_C = 50 \text{ Adc}, I_B = 5.0 \text{ Adc}$ $I_C = 40 \text{ Adc}, I_B = 4.0 \text{ Adc}$	2N6032 2N6033	$V_{BE(sat)}$		2.0 2.0	Vdc

**DYNAMIC CHARACTERISTICS**

Magnitude of Common Emitter Small-Signal Short-Circuit Forward Current Transfer Ratio $I_C = 2.0 \text{ Adc}, V_{CE} = 10 \text{ Vdc}, f = 5.0 \text{ MHz}$	$ h_{fe} $	10	40	
Output Capacitance $V_{CB} = 10 \text{ Vdc}, I_E = 0, 100 \text{ kHz} \leq f \leq 1.0 \text{ MHz}$	$C_{obo}$		1,000	pF

**SWITCHING CHARACTERISTICS**

Turn-On Time $V_{CC} = 30 \text{ Vdc}; I_C = 50 \text{ Adc}; I_B = 5.0 \text{ Adc}$ $V_{CC} = 30 \text{ Vdc}; I_C = 40 \text{ Adc}; I_B = 4.0 \text{ Adc}$	2N6032 2N6033	$t_{on}$		0.5 0.5	$\mu\text{s}$
Turn-Off Time $V_{CC} = 30 \text{ Vdc} \pm 2; I_C = 50 \text{ Adc}; I_{B1} = 5 I_{B2} = -5 \text{ Adc}$ $V_{CC} = 30 \text{ Vdc} \pm 2; I_C = 40 \text{ Adc}; I_{B1} = 4 I_{B2} = -4 \text{ Adc}$	2N6032 2N6033	$t_{off}$		2.0 2.0	$\mu\text{s}$

**SAFE OPERATING AREA**

<b>DC Tests</b> $T_C = +25^\circ\text{C}, 1 \text{ Cycle}, t = 1.0 \text{ s}$				
<b>Test 1</b> $V_{CE} = 2.8 \text{ Vdc}, I_C = 50 \text{ Adc}$	2N6032			
<b>Test 2</b> $V_{CE} = 3.5 \text{ Vdc}, I_C = 40 \text{ Adc}$	2N6033			
<b>Test 3</b> $V_{CE} = 24 \text{ Vdc}, I_C = 5.8 \text{ Adc}$	All Types			
<b>Test 4</b> $V_{CE} = 40 \text{ Vdc}, I_C = 0.9 \text{ Adc}$	All Types			
<b>Test 5</b> $V_{CE} = 90 \text{ Vdc}, I_C = 0.18 \text{ Adc}$	2N6032			
<b>Test 6</b> $V_{CE} = 120 \text{ Vdc}, I_C = 0.1 \text{ Adc}$	2N6033			

(2) Pulse Test: Pulse Width = 300 $\mu\text{s}$ , Duty Cycle  $\leq$  2.0%.