

# MAXIMUM RATINGS

Rating	Symbol	2N4234	2N4235	2N4236	Unit
Collector-Emitter Voltage	$V_{CEO}$	40	60	80	Vdc
Collector-Base Voltage	$V_{CBO}$	40	60	80	Vdc
Emitter-Base Voltage	$V_{EBO}$	7.0			Vdc
Base Current	$I_B$	0.2			Vdc
Collector Current — Continuous	$I_C$	1.0 3.0*			Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	1.0 5.7			Watt mW/°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$	$P_D$	6.0 34			Watts mW/°C
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	-65 to +200			°C

# THERMAL CHARACTERISTICS

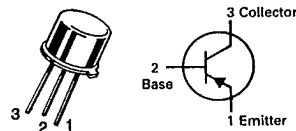
Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	29	°C/W

2N4234

thru

2N4236

CASE 79-04, STYLE 1  
TO-39 (TO-205AD)



GENERAL PURPOSE  
TRANSISTORS

PNP SILICON

T-27-21

Boca  
Semiconductor  
corp.

3

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Sustaining Voltage(1) ( $I_C = 100\text{ mA}$ , $I_B = 0$ )	$V_{CEO(sus)}$	40 60 80	— — —	Vdc
Collector Cutoff Current ( $V_{CE} = 30\text{ Vdc}$ , $I_B = 0$ ) ( $V_{CE} = 40\text{ Vdc}$ , $I_B = 0$ ) ( $V_{CE} = 60\text{ Vdc}$ , $I_B = 0$ )	$I_{CEO}$	— — —	1.0 1.0 1.0	mA
Collector Cutoff Current ( $V_{CE} = 40\text{ Vdc}$ , $V_{BE} = 1.5\text{ Vdc}$ ) ( $V_{CE} = 60\text{ Vdc}$ , $V_{BE} = 1.5\text{ Vdc}$ ) ( $V_{CE} = 80\text{ Vdc}$ , $V_{BE} = 1.5\text{ Vdc}$ ) ( $V_{CE} = 30\text{ Vdc}$ , $V_{BE} = 1.5\text{ Vdc}$ , $T_C = 150^\circ\text{C}$ ) ( $V_{CE} = 40\text{ Vdc}$ , $V_{BE} = 1.5\text{ Vdc}$ , $T_C = 150^\circ\text{C}$ ) ( $V_{CE} = 60\text{ Vdc}$ , $V_{BE} = 1.5\text{ Vdc}$ , $T_C = 150^\circ\text{C}$ )	$I_{CEX}$	— — — — — —	0.1 0.1 0.1 1.0 1.0 1.0	mA
Collector Cutoff Current ( $V_{CB} = 40\text{ Vdc}$ , $I_E = 0$ ) ( $V_{CB} = 60\text{ Vdc}$ , $I_E = 0$ ) ( $V_{CB} = 80\text{ Vdc}$ , $I_E = 0$ )	$I_{CBO}$	— — —	0.1 0.1 0.1	mA
Emitter Cutoff Current ( $V_{BE} = 7\text{ Vdc}$ , $I_C = 0$ )	$I_{EBO}$	—	0.5	mA
<b>ON CHARACTERISTICS</b>				
DC Current Gain(1) ( $I_C = 100\text{ mA}$ , $V_{CE} = 1.0\text{ Vdc}$ ) ( $I_C = 250\text{ mA}$ , $V_{CE} = 1.0\text{ Vdc}$ ) ( $I_C = 500\text{ mA}$ , $V_{CE} = 1.0\text{ Vdc}$ ) ( $I_C = 1.0\text{ A}$ , $V_{CE} = 1.0\text{ Vdc}$ )	$h_{FE}$	40 30 20 10	— 150 — —	—
Collector-Emitter Saturation Voltage(1) ( $I_C = 1.0\text{ A}$ , $I_B = 125\text{ mA}$ )	$V_{CE(sat)}$	—	0.6	Vdc
Base-Emitter Saturation Voltage(1) ( $I_C = 1.0\text{ A}$ , $I_B = 100\text{ mA}$ )	$V_{BE(sat)}$	—	1.5	Vdc
Base-Emitter On Voltage ( $I_C = 250\text{ mA}$ , $V_{CE} = 1.0\text{ Vdc}$ )	$V_{BE}$	—	1.0	Vdc
<b>SMALL-SIGNAL CHARACTERISTICS</b>				
Current-Gain — Bandwidth Product ( $I_C = 100\text{ mA}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ MHz}$ )	$f_T$	3.0	—	MHz

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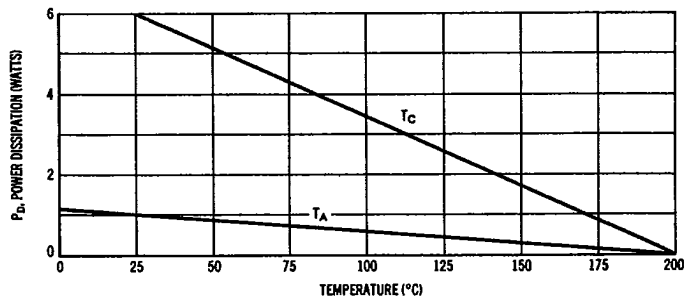
# **ELECTRICAL CHARACTERISTICS** (continued) ( $T_A = 25^\circ\text{C}$ unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
Output Capacitance ( $V_{CB} = 10\text{ Vdc}$ , $I_E = 0$ , $f = 100\text{ kHz}$ )	$C_{obo}$	—	100	pF
Small-Signal Current Gain ( $I_C = 50\text{ mAdc}$ , $V_{CE} = 10\text{ Vdc}$ , $f = 1.0\text{ kHz}$ )	$h_{fe}$	25	—	—

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

\*Indicates Data in addition to JEDEC Requirements.

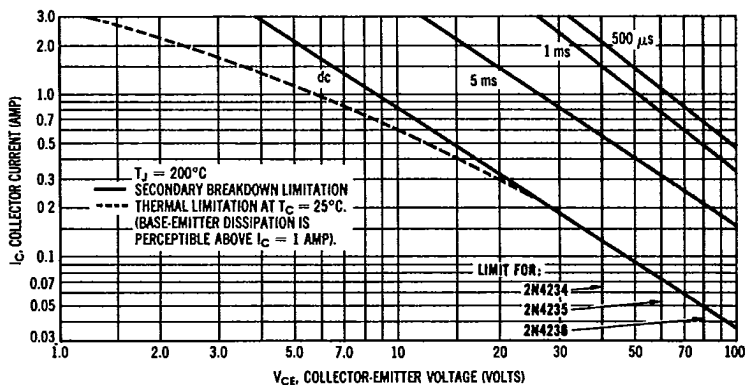
**FIGURE 1 — POWER-TEMPERATURE DERATING CURVE**



Safe Area Curves are indicated by Figure 2.

All limits are applicable and must be observed.

**FIGURE 2 — ACTIVE-REGION SAFE OPERATING AREAS**



The Safe Operating Area Curves indicate  $I_C - V_{CE}$  limits below which the device will not enter secondary breakdown. Collector load lines for specific circuits must fall within the applicable Safe Area to avoid causing a catastrophic failure. To insure operation below the maximum  $T_J$ , power-temperature derating must be observed for both steady state and pulse power conditions.

# LARGE SIGNAL CHARACTERISTICS

FIGURE 3 — TRANSCONDUCTANCE

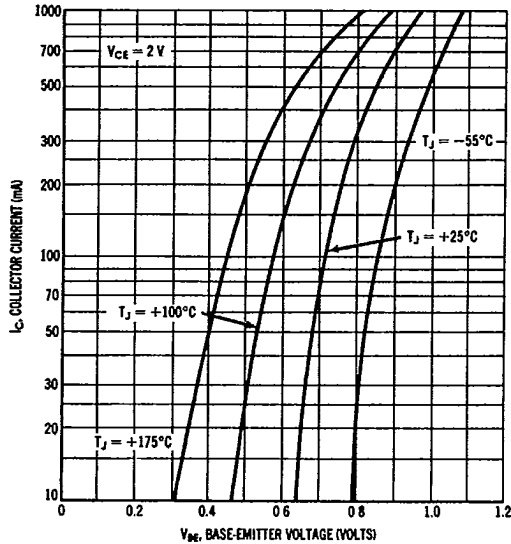
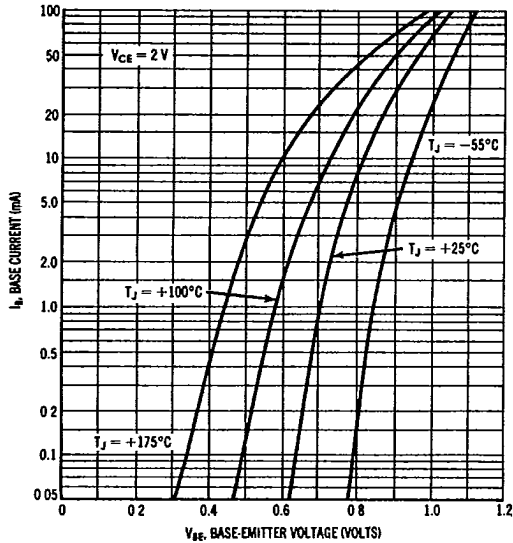


FIGURE 4 — INPUT ADMITTANCE



# "OFF" REGION CHARACTERISTICS

FIGURE 5 — TRANSCONDUCTANCE

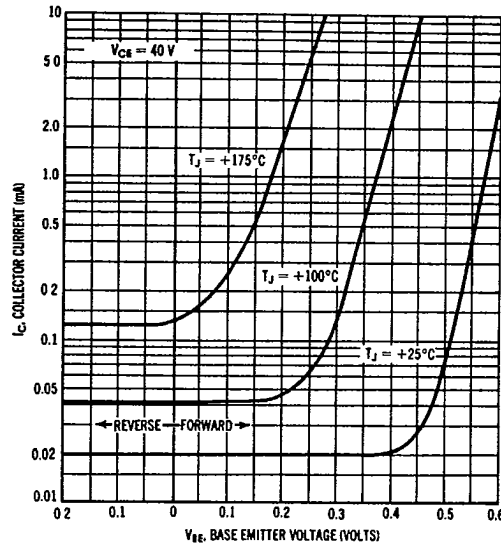


FIGURE 6 — EFFECTS OF BASE-EMITTER RESISTANCE

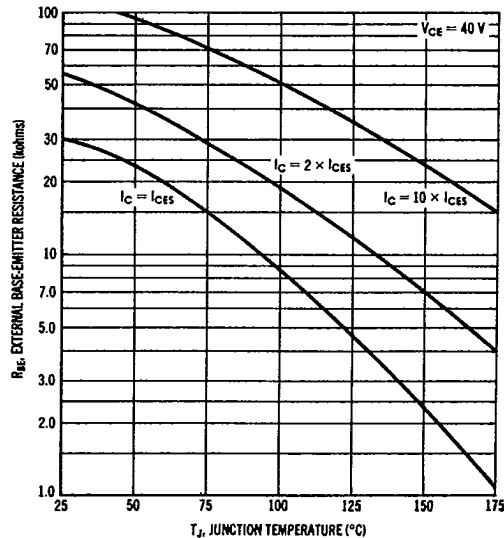
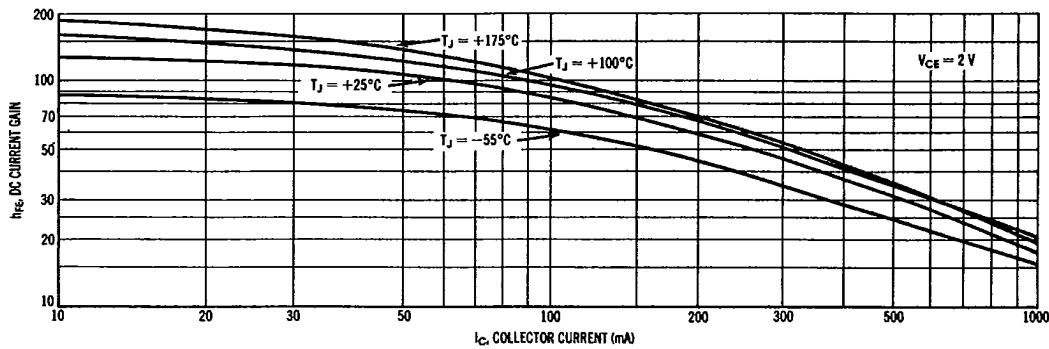


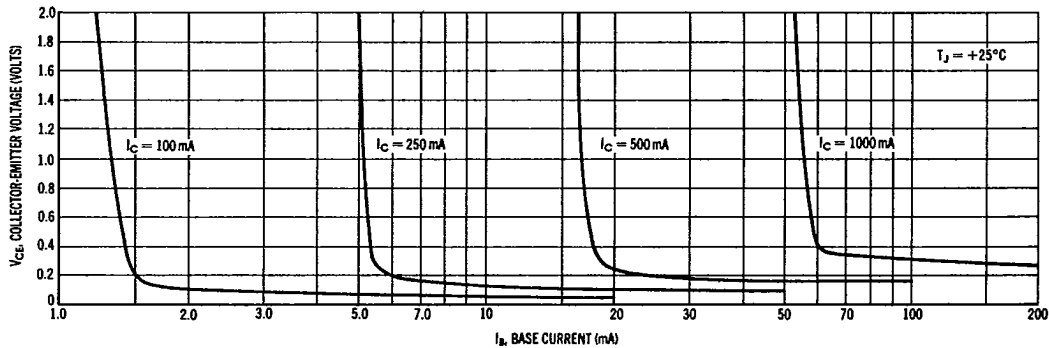
FIGURE 7 — CURRENT GAIN



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### SATURATION REGION CHARACTERISTICS

FIGURE 8 — COLLECTOR SATURATION REGION



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FIGURE 9 — "ON" VOLTAGES

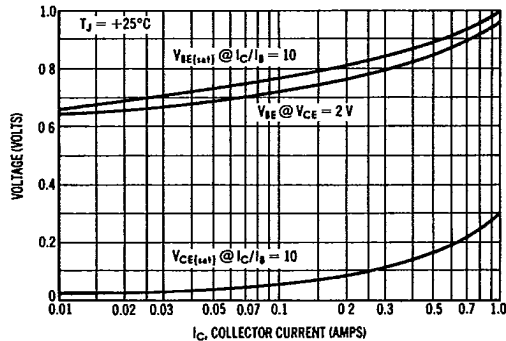


FIGURE 10 — TEMPERATURE COEFFICIENTS

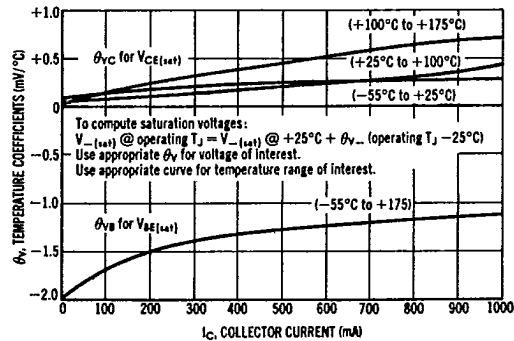


FIGURE 11 — TURN-ON TIME

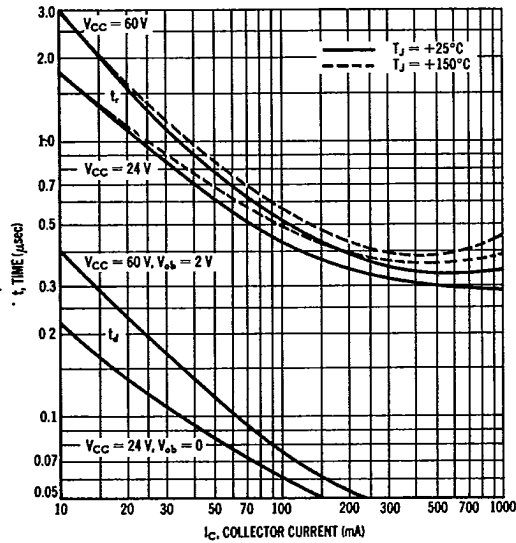


FIGURE 12 — STORAGE TIME

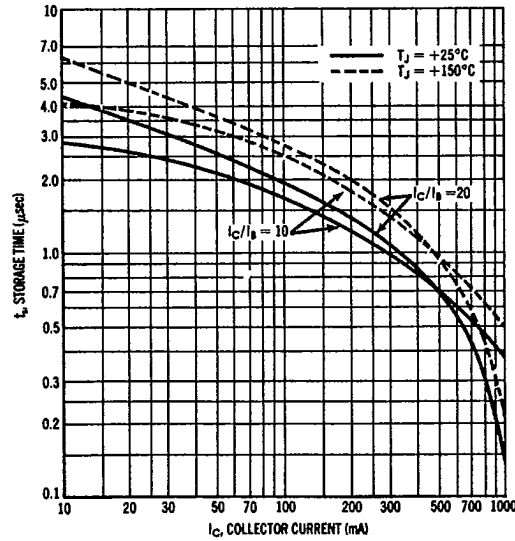


FIGURE 13 — CAPACITANCE

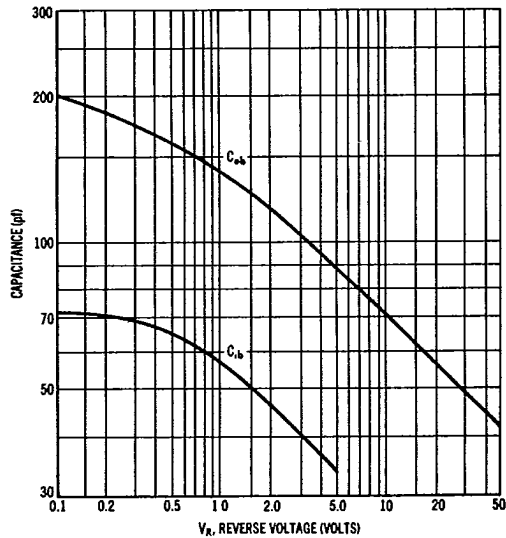


FIGURE 14 — FALL TIME

