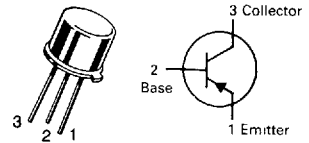


2N3244

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



**GENERAL PURPOSE
TRANSISTOR**

PNP SILICON

MAXIMUM RATINGS

Characteristic	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	-40	Vdc
Collector-Base Voltage	V_{CBO}	-40	Vdc
Emitter-Base Voltage	V_{EBO}	-5.0	Vdc
Collector Current — Continuous	I_C	-1.0	Adc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	1.0 5.71	Watt mW/°C
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	5.0 28.6	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 Ambient	$R_{\theta JA}$	0.175	°C/mW
Thermal Resistance, Junction to Case	$R_{\theta JC}$	35	°C/W

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

Characteristic	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Collector-Emitter Breakdown Voltage(1) ($I_C = -10 \text{ mAdc}, I_E = 0$)	$V_{(BR)CEO}$	-40	—	Vdc
Collector-Base Breakdown Voltage ($I_C = -10 \mu\text{Adc}, I_E = 0$)	$V_{(BR)CBO}$	-40	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = -10 \mu\text{Adc}, I_C = 0$)	$V_{(BR)EBO}$	-5.0	—	Vdc
Base Cutoff Current ($V_{CE} = -30 \text{ Vdc}, V_{EB} = -3.0 \text{ Vdc}$)	I_{BEV}	—	-80	nAdc
Collector Cutoff Current ($V_{CE} = -30 \text{ Vdc}, V_{EB} = -3.0 \text{ Vdc}$)	I_{CEX}	—	-50	nAdc
Collector Cutoff Current ($V_{CB} = -30 \text{ Vdc}, I_E = 0$) ($V_{CB} = -30 \text{ Vdc}, I_E = 0, T_A = 100^\circ\text{C}$)	I_{CBO}	— —	-0.050 -10	μAdc
Emitter Cutoff Current ($V_{EB} = -4.0 \text{ Vdc}, I_C = 0$)	I_{EBO}	—	-30	nAdc
ON CHARACTERISTICS				
DC Current Gain(1) ($I_C = -150 \text{ mAdc}, V_{CE} = -1.0 \text{ Vdc}$) ($I_C = -500 \text{ mAdc}, V_{CE} = -1.0 \text{ Vdc}$) ($I_C = -1.0 \text{ Adc}, V_{CE} = -5.0 \text{ Vdc}$)	h_{FE}	60 50 25	— 150 —	—
Collector-Emitter Saturation Voltage(1) ($I_C = -150 \text{ mAdc}, I_B = -15 \text{ mAdc}$) ($I_C = -500 \text{ mAdc}, I_B = -50 \text{ mAdc}$) ($I_C = -1.0 \text{ Adc}, I_B = -100 \text{ mAdc}$)	$V_{CE(sat)}$	— — —	-0.3 -0.5 -1.0	Vdc

6367254 0103823 560

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

Characteristic	Symbol	Min	Max	Unit
Base-Emitter Saturation Voltage(1) ($I_C = -150\text{ mA}$, $I_B = -15\text{ mA}$) ($I_C = -500\text{ mA}$, $I_B = -50\text{ mA}$) ($I_C = -1.0\text{ A}$, $I_B = -100\text{ mA}$) ($I_C = -750\text{ mA}$, $I_B = -75\text{ mA}$)	$V_{BE(sat)}$	— -0.75 — —	-1.1 -1.5 -2.0 -2.0	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product ($I_C = -50\text{ mA}$, $V_{CE} = -10\text{ Vdc}$, $f = 100\text{ MHz}$)	f_T	175	—	MHz
Output Capacitance ($V_{CB} = -10\text{ Vdc}$, $I_E = 0$, $f = 100\text{ kHz}$)	C_{obo}	—	25	pF
Input Capacitance ($V_{EB} = -0.5\text{ Vdc}$, $I_C = 0$, $f = 100\text{ kHz}$)	C_{ibo}	—	100	pF

SWITCHING CHARACTERISTICS

Delay Time	($I_C = -500\text{ mA}$, $I_{B1} = -50\text{ mA}$ $V_{BE} = +2.0\text{ V}$, $V_{CC} = -30\text{ V}$)	t_d	—	15	ns
Rise Time		t_r	—	35	ns
Storage Time	($I_C = -500\text{ mA}$, $V_{CC} = -30\text{ V}$ $I_{B1} = I_{B2} = -50\text{ mA}$)	t_s	—	140	ns
Fall Time		t_f	—	45	ns
Total Control Charge ($I_C = -500\text{ mA}$, $I_B = -50\text{ mA}$, $V_{CC} = -30\text{ V}$)		Q_T	—	14	nC

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

FIGURE 1 — MINIMUM CURRENT GAIN CHARACTERISTICS

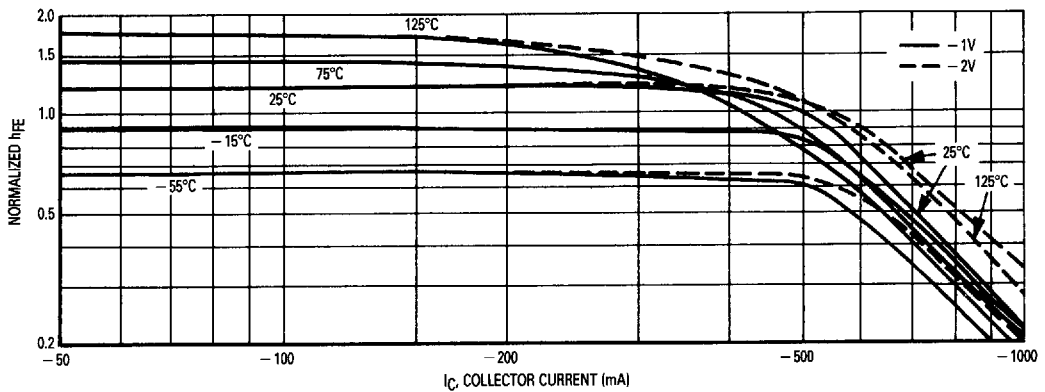


FIGURE 2 — COLLECTOR-EMITTER SATURATION VOLTAGE CHARACTERISTICS

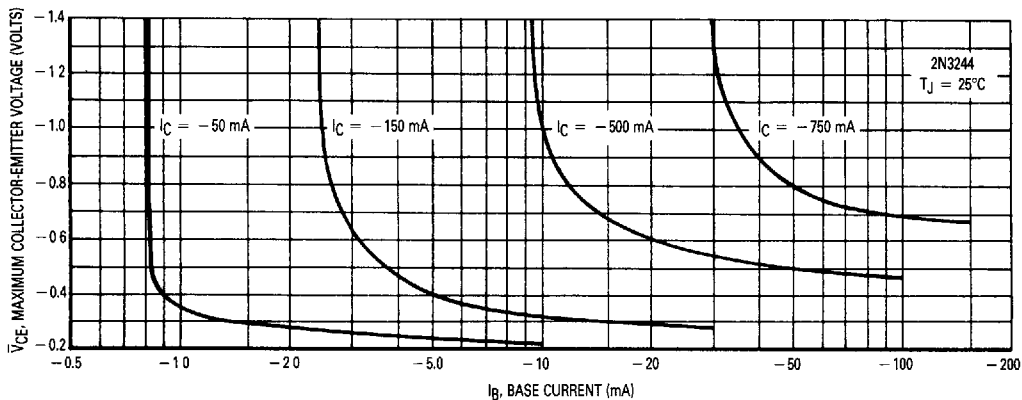


FIGURE 3 — MAXIMUM SATURATION VOLTAGES

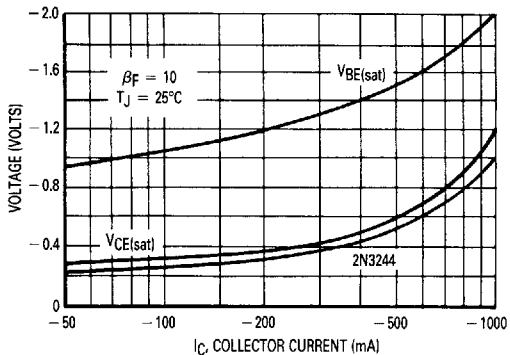
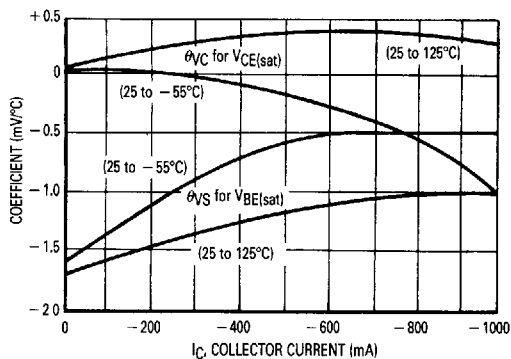


FIGURE 4 — TYPICAL TEMPERATURE COEFFICIENTS



2N3244

FIGURE 5 — JUNCTION CAPACITANCE

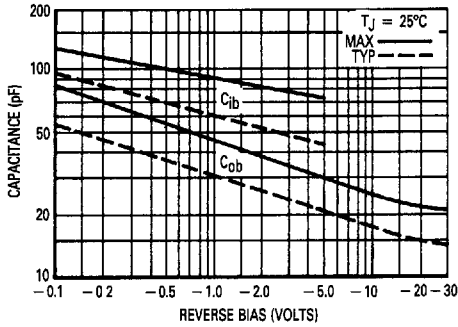


FIGURE 6 — TYPICAL SWITCHING TIMES

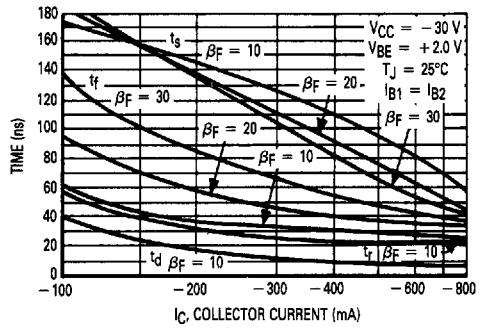


FIGURE 7 — CHARGE DATA

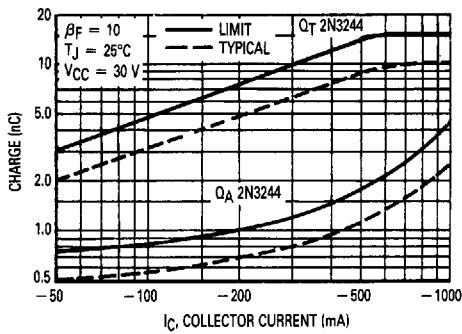


FIGURE 8 — TURN-ON EQUIVALENT TEST CIRCUIT

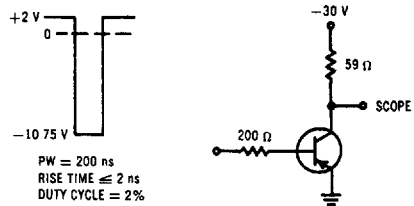


FIGURE 9 — TURN-OFF EQUIVALENT TEST CIRCUIT

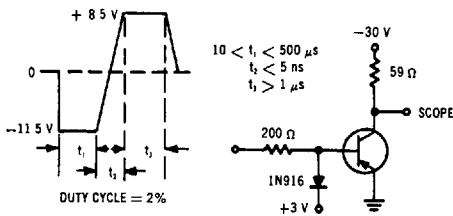


FIGURE 10 — Q_T TEST CIRCUIT

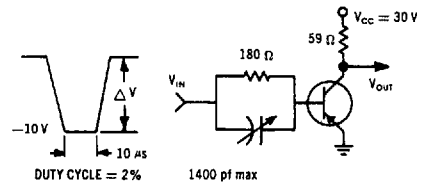


FIGURE 11 — TURN-OFF WAVEFORM

