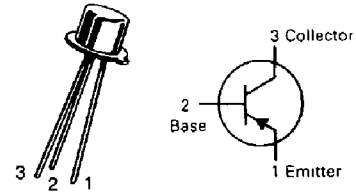


2N2894CASE 22-03, STYLE 1
TO-18 (TO-206AA)**SWITCHING TRANSISTOR**

PNP SILICON

3

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage(1)	V_{CE0}	-12	Vdc
Collector-Base Voltage	V_{CE0}	-12	Vdc
Emitter-Base Voltage	V_{EBO}	-4.0	Vdc
Collector Current — Continuous	I_C	-200	mA dc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	360 2.06	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1200 6.85	mW mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	486	$^\circ\text{C}/\text{W}$
Thermal Resistance, Junction to Case	$R_{\theta JC}$	146	$^\circ\text{C}/\text{W}$

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

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C = -10 \mu\text{A dc}, V_{BE} = 0$)	$V_{(BR)CES}$	-12	—	Vdc
Collector-Emitter Sustaining Voltage(2) ($I_C = -10 \text{ mA dc}, I_B = 0$)	$V_{CE0(sus)}$	-12	—	Vdc
Collector-Base Breakdown Voltage ($I_C = -10 \mu\text{A dc}, I_B = 0$)	$V_{(BR)CBO}$	-12	—	Vdc
Emitter-Base Breakdown Voltage ($I_E = -100 \mu\text{A dc}, I_C = 0$)	$V_{(BR)EBO}$	-4.0	—	Vdc
Collector Cutoff Current ($V_{CB} = -6.0 \text{ Vdc}, I_E = 0, T_A = 125^\circ\text{C}$)	I_{CBO}	—	-10	$\mu\text{A dc}$
Collector Cutoff Current ($V_{CE} = -6.0 \text{ Vdc}, V_{BE} = 0$)	I_{CES}	—	-80	nA dc
Base Current ($V_{CE} = -6.0 \text{ Vdc}, V_{BE} = 0$)	I_B	—	-80	nA dc

ON CHARACTERISTICS

DC Current Gain(2) ($I_C = -10 \text{ mA dc}, V_{CE} = -0.3 \text{ Vdc}$) ($I_C = -30 \text{ mA dc}, V_{CE} = -0.5 \text{ Vdc}$) ($I_C = -30 \text{ mA dc}, V_{CE} = -0.5 \text{ Vdc}, T_A = -55^\circ\text{C}$) ($I_C = -100 \text{ mA dc}, V_{CE} = -1.0 \text{ Vdc}$)(2)	h_{FE}	30 40 17 25	— 150 — —	—
Collector-Emitter Saturation Voltage(2) ($I_C = -10 \text{ mA dc}, I_B = -1.0 \text{ mA dc}$) ($I_C = -30 \text{ mA dc}, I_B = -3.0 \text{ mA dc}$) ($I_C = -100 \text{ mA dc}, I_B = -10 \text{ mA dc}$)	$V_{CE(sat)}$	— — —	-0.15 -0.2 -0.5	Vdc
Base-Emitter Saturation Voltage(2) ($I_C = -10 \text{ mA dc}, I_B = -1.0 \text{ mA dc}$) ($I_C = -30 \text{ mA dc}, I_B = -3.0 \text{ mA dc}$) ($I_C = -100 \text{ mA dc}, I_B = -10 \text{ mA dc}$)	$V_{BE(sat)}$	-0.78 -0.85 —	-0.98 -1.2 -1.7	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product ($I_C = -30 \text{ mA dc}, V_{CE} = -10 \text{ Vdc}, f = 100 \text{ MHz}$)	f_T	400	—	MHz
Output Capacitance ($V_{CB} = -5.0 \text{ Vdc}, I_E = 0, f = 1.0 \text{ MHz}$)	C_{obo}	—	6.0	pF
Input Capacitance ($V_{EB} = -0.5 \text{ Vdc}, I_C = 0, f = 1.0 \text{ MHz}$)	C_{ibo}	—	6.0	pF

SWITCHING CHARACTERISTICS

Turn-On Time ($V_{CC} = -2.0 \text{ Vdc}, V_{EB} = -3.0 \text{ Vdc}, I_{B1} = -1.5 \text{ mA dc}$)	t_{on}	—	60	ns
Turn-Off Time ($V_{CC} = -2.0 \text{ Vdc}, I_C = -30 \text{ mA dc}, I_{B1} = I_{B2} = -1.5 \text{ mA dc}$)	t_{off}	—	90	ns

(1) Applicable from 0.01 to 10 mA dc.

(2) Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

MOTOROLA SMALL-SIGNAL TRANSISTORS, FETs AND DIODES