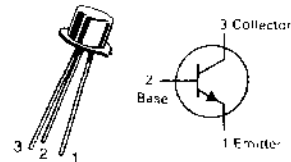


**MAXIMUM RATINGS**

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	$V_{CE0}$	15	Vdc
Collector-Emitter Voltage(1)	$V_{CER}$	20	Volts
Collector-Base Voltage	$V_{CB0}$	25	Volts
Emitter-Base Voltage	$V_{EB0}$	5.0	Volts
Collector Current	$I_C$	50	mA
Total Device Dissipation (at $T_A = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$ )	$P_D$	0.3 2.0	Watt mW/°C
Total Device Dissipation (at $T_C = 25^\circ\text{C}$ Derate above $25^\circ\text{C}$ )	$P_D$	1.0 5.7	Watts mW/°C
Total Device Dissipation (at $T_C = 100^\circ\text{C}$ Derate above $100^\circ\text{C}$ )	$P_D$	0.5	Watt
Operating and Storage Junction Temperature Range	$T_J, T_{stg}$	65 to 1200	°C

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	500	°C/W
Thermal Resistance, Junction to Case	$R_{\theta JC}$	175	°C/W

**2N706A**
**CASE 22-03, STYLE 1  
TO-18 (TO-206AA)**

**SWITCHING TRANSISTOR**
**NPN SILICON**
**3**

Refer to 2N2369 for graphs.

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

Characteristic	Symbol	Min	Max	Unit
<b>OFF CHARACTERISTICS</b>				
Collector-Emitter Breakdown Voltage(2) ( $I_C = 10\text{ mAdc}, I_B = 0$ )	$V_{(BR)CEO}$	15	—	Vdc
Collector-Emitter Breakdown Voltage(2) ( $I_R = 10\text{ ohms}, I_C = 10\text{ mAdc}$ )	$V_{(BR)CER}$	20	—	Vdc
Collector Cutoff Current ( $V_{CB} = 15\text{ Vdc}, I_E = 0$ ) ( $V_{CB} = 15\text{ Vdc}, I_E = 0, T_A = 150^\circ\text{C}$ ) ( $V_{CB} = 25\text{ Vdc}, I_E = 0$ )	$I_{CB0}$	— — —	0.5 30 10	$\mu\text{A dc}$
Collector Cutoff Current ( $V_{CE} = 20\text{ Vdc}, R_{BE} = 100\text{k}$ )	$I_{CER}$	—	10	$\mu\text{A dc}$
Emitter Cutoff Current ( $V_{EB} = 5.0\text{ Vdc}, I_C = 0$ )	$I_{EBO}$	—	10	$\mu\text{A dc}$
<b>ON CHARACTERISTICS</b>				
DC Current Gain (2) ( $I_C = 10\text{ mA dc}, V_{CE} = 1.0\text{ Vdc}$ )	$h_{FE}$	20	60	—
Collector-Emitter Saturation Voltage(2) ( $I_C = 10\text{ mA dc}, I_B = 1.0\text{ mA dc}$ )	$V_{CE(sat)}$	—	0.6	Vdc
Base-Emitter Saturation Voltage(2) ( $I_C = 10\text{ mA dc}, I_B = 1.0\text{ mA dc}$ )	$V_{BE(sat)}$	0.7	0.9	Vdc
<b>SMALL-SIGNAL CHARACTERISTICS</b>				
Current-Gain -- Bandwidth Product ( $V_{CE} = 15\text{ Vdc}, I_E = 10\text{ mA dc}, f = 100\text{ MHz}$ )	$f_T$	200	—	MHz
Output Capacitance ( $V_{CB} = 5.0\text{ Vdc}, I_E = 0, f = 1\text{ MHz}$ )	$C_{ob0}$	—	5.0	pF
Magnitude of Forward Current Transfer Ratio, Common-Emitter ( $V_{CE} = 10\text{ Vdc}, I_E = 10\text{ mA dc}, f = 100\text{ MHz}$ )	$ h_{FE} $	2.0	—	—

## 2N706A

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

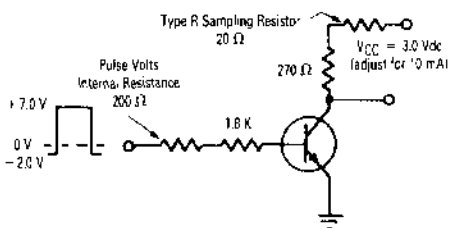
Characteristic	Symbol	Min	Max	Unit
Collector Base Time Constant ( $V_{CE} = 15\text{ Vdc}$ , $I_E = 10\text{ mA}$ , $f = 300\text{ MHz}$ )	$\tau_b$	—	50	ohms
Turn-On Time ( $I_{B1} = 3.0\text{ mA}$ , $I_{B2} = 1.0\text{ mA}$ )	$t_{on}$	—	40	ns
Turn-Off Time ( $I_{B1} = 3.0\text{ mA}$ , $I_{B2} = 1.0\text{ mA}$ )	$t_{off}$	—	75	ns
Charge Storage Time Constant(2)	$\tau_s$	—	25	ns

(1) Refers to collector breakdown voltage in the high current region when  $R_{BE} = 10\ \Omega$ .

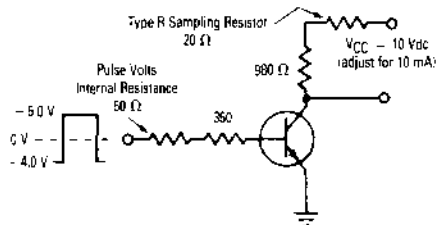
(2) Pulse Test: Pulse Width  $\leq 300\ \mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

(3) Switching Times Measured with Tektronix Type R Plug-In ( $50\ \Omega$  Internal Impedance).

**SWITCHING TIME TEST CIRCUIT**



**STORAGE TIME TEST CIRCUIT**



**MEASUREMENT CIRCUIT**

