

2N706,A,B

(2N706 JAN AVAILABLE)
CASE 22, STYLE 1
TO-18 (TO-206AA)

SWITCHING TRANSISTOR

NPN SILICON

Refer to 2N2368 for graphs.

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	2N706A,B V _{CEO}	15	Vdc
Collector-Emitter Voltage(1)	V _{CER}	20	Volts
Collector-Base Voltage	V _{CBO}	25	Volts
Emitter-Base Voltage	2N706 2N706A 2N706B V _{EBO}	3.0 5.0 5.0	Volts
Collector Current	2N706,A,B I _C	50	mA
Total Device Dissipation @ T _A = 25°C Derate above 25°C	P _D	0.3 2.0	Watt mW/°C
Total Device Dissipation @ T _C = 25°C Derate above 25°C	P _D	1.0 6.67	Watts mW/°C
Total Device Dissipation @ T _C = 100°C Derate above 100°C	P _D	0.5	Watt
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 _{θJC}	150	°C/W
Thermal Resistance, Junction to Ambient	R _{θJA}	500	°C/W

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage(2) (I _C = 10 mAdc, I _B = 0)	V _{(BR)CEO}	15	—	Vdc
Collector-Emitter Breakdown Voltage(2) (R = 10 ohms, I _C = 10 mAdc)	V _{(BR)CER}	20	—	Vdc
Collector Cutoff Current (V _{CB} = 15 Vdc, I _E = 0) (V _{CB} = 15 Vdc, I _E = 0, T _A = 150°C) (V _{CB} = 25 Vdc, I _E = 0)	I _{CBO}	— — —	0.5 30 10	μAdc
Collector Cutoff Current (V _{CE} = 20 Vdc, R _{BE} = 100k)	I _{CER}	—	10	μAdc
Emitter Cutoff Current (V _{EB} = 3.0 Vdc, I _C = 0) (V _{EB} = 5.0 Vdc, I _C = 0)	I _{EBO}	— —	10 10	μAdc

ON CHARACTERISTICS

DC Current Gain(2) (I _C = 10 mAdc, V _{CE} = 1.0 Vdc)	h _{FE}	20 20	— 60	—
Collector-Emitter Saturation Voltage(2) (I _C = 10 mAdc, I _B = 1.0 mAdc)	V _{CE(sat)}	— —	0.6 0.4	Vdc
Base-Emitter Saturation Voltage(2) (I _C = 10 mAdc, I _B = 1.0 mAdc)	V _{BE(sat)}	— 0.7	0.9 0.9	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain — Bandwidth Product (V _{CE} = 15 Vdc, I _E = 10 mAdc, f = 100 MHz)	f _T	200	—	MHz
Output Capacitance (V _{CB} = 5.0 Vdc, I _E = 0) (V _{CB} = 10 Vdc, I _E = 0)	C _{obo}	— —	5.0 6.0	pF
Magnitude of Forward Current Transfer Ratio, Common-Emitter (V _{CE} = 15 Vdc, I _E = 10 mAdc, f = 100 MHz) (V _{CE} = 10 Vdc, I _E = 10 mAdc, f = 100 MHz)	h _{fe}	2.0 2.0	— —	—

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

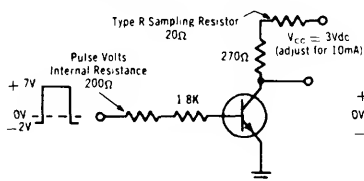
Characteristic	Symbol	Min	Max	Unit
Collector Base Time Constant ($V_{CE} = 15\text{ Vdc}$, $I_E = 10\text{ mAdc}$, $f = 300\text{ MHz}$)	r_b	—	50	ohms
Storage Time 2N706B	t_s	—	25	ns
Turn-On Time ($I_{B1} = 3.0\text{ mA}$, $I_{B2} = 1.0\text{ mA}$)	t_{on}	—	40	ns
Turn-Off Time ($I_{B1} = 3.0\text{ mA}$, $I_{B2} = 1.0\text{ mA}$)	t_{off}	—	75	ns
Charge Storage Time Constant(2) 2N706 2N706A,B	τ_s	—	60 25	ns

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

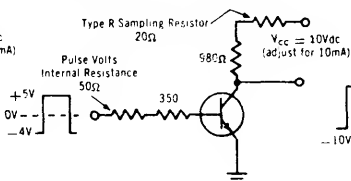
(2) Pulse Test: Pulse Width $\leq 12\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

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

SWITCHING TIME TEST CIRCUIT



STORAGE TIME TEST CIRCUIT



MEASUREMENT CIRCUIT

