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P2N4031
P2N4033

CASE 29-03, STYLE 1
TO-92 (TO-226AE)

ONE WATT
AMPLIFIER TRANSISTORS

PNP SILICON

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Emitter Voltage	V_{CEO}	80	Vdc
Collector-Base Voltage	V_{CBO}	80	Vdc
Emitter-Base Voltage	V_{EBO}	5.0	Vdc
Collector Current – Continuous	I_C	1.0	Adc
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	1.0 8.0	W mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	2.5 20	W mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−55 to +150	°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	50	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JC}$	125	°C/W

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 10 mA)		$V_{(BR)CEO}$	80	—	V
Collector-Base Breakdown Voltage (I_C = 10 μA)		$V_{(BR)CBO}$	80	—	V
Emitter-Base Breakdown Voltage (I_E = 10 μA)		$V_{(BR)EBO}$	5.0	—	V
Collector Cutoff Current (V_{CB} = 60 V) (V_{CB} = 60 V, T_A = 150°C)		I_{CBO}	— —	5.0 50	nA μA
Emitter Cutoff Current (V_{EB} = 5.0 V)		I_{EBO}	—	10	nA
ON CHARACTERISTICS					
DC Current Gain		h_{FE}			—
(I_C = 100 mA, V_{CE} = 5.0 V, −55°C)	P2N4031		15	—	
	P2N4033		40	—	
(I_C = 100 μA, V_{CE} = 5.0 V)	P2N4031		30	—	
	P2N4033		75	—	
(I_C = 100 mA, V_{CE} = 5.0 V)	P2N4031		40	120	
	P2N4033		100	300	
(I_C = 500 mA, V_{CE} = 5.0 V)	P2N4031		25	—	
	P2N4033		70	—	
(I_C = 1.0 A, V_{CE} = 5.0 V)	P2N4031		10	—	
	P2N4033		25	—	
Collector-Emitter Saturation Voltage (I_C = 150 mA, I_B = 15 mA) (I_C = 500 mA, I_B = 50 mA)		$V_{CE(sat)}$	— —	0.15 0.50	V
Base-Emitter Saturation Voltage (I_C = 150 mA, I_B = 15 mA) (I_C = 500 mA, I_B = 50 mA)		$V_{BE(sat)}$	— —	0.9 1.1	V

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

Characteristic	Symbol	Min	Max	Unit
SMALL-SIGNAL CHARACTERISTICS				
Output Capacitance (V_{CE} = 10 V, f = 1.0 MHz)	C_{obo}	—	25	pF
Input Capacitance (V_{EB} = 0.5 V, f = 1.0 MHz)	C_{ibo}	—	150	pF
Current Gain — Bandwidth Product (I_C = 50 mA, V_{CC} = 10 V, f = 100 MHz)	f_T	150		MHz
SWITCHING CHARACTERISTICS				
Turn-On Time (see Figure 1) (I_C = 500 mA, I_{B1} = 50 mA)	t_{on}	—	100	ns
Turn-Off Time (see Figure 1) (I_C = 500 mA, I_{B1} = I_{B2} = 50 mA)	t_{off}	—	400	ns

(1) Pulse Width = 300 μs, Duty Cycle 1.0%.

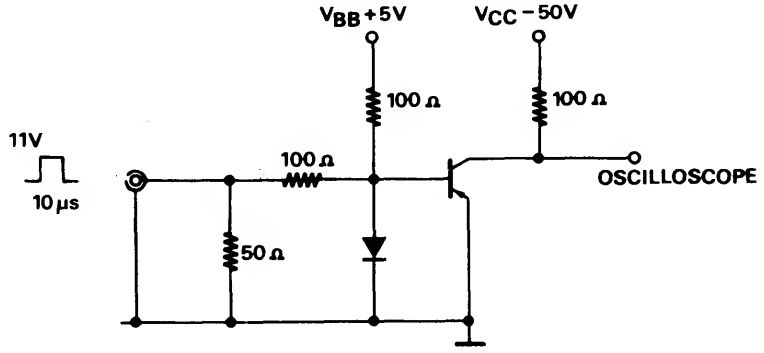

FIGURE 1: SWITCHING TIMES TEST CIRCUIT