2N5022
2N5023

CASE 079-02, STYLE 1
TO-39 (TO-205AD)

GENERAL PURPOSE TRANSISTOR

PNP SILICON

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Refer to 2N3467 for graphs.

MAXIMUM RATINGS

Rating	Symbol	2N5022	2N5023	Unit
Collector-Emitter Voltage	V_{CEO}	50	30	V
Collector-Emitter Voltage	V_{CES}	50	30	V
Collector-Base Voltage	V_{CBO}	50	30	V
Emitter-Base Voltage	V_{EBO}	5		V
Collector Current — Continuous (Pulse Width = 300 μs, DC = 1%)	I_C	1.0*		A
Total Device Dissipation @ T_A = 25°C Derate above 25°C	P_D	1.0 5.72		Watts mW/°C
Total Device Dissipation @ T_C = 25°C Derate above 25°C	P_D	4.0 22.8		Watts mW/°C
Operating and Storage Junction Temperature Range	T_J, T_{stg}	−65 to +200		°C
Maximum Lead Temperature (Soldering, 60 sec max)	T_L	+300		°C

THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction to Case	$R_{\theta JC}$	43.8	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	175	°C/W

*Indicates Data in Addition to JEDEC Requirements.

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

Characteristic		Symbol	Min	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage (I_C = 100 μAdc)	2N5022 2N5023	$V_{(BR)CES}$	 50 30	 — —	V
Collector-Emitter Sustaining Voltage (I_C = 10 mAdc)	2N5022 2N5023	$V_{(BR)CEO(sus)}$*	 50 30	 — —	V
Collector-Base Breakdown Voltage (I_C = 100 μAdc)	2N5022 2N5023	$V_{(BR)CBO}$	 50 30	 — —	V
Emitter-Base Breakdown Voltage (I_E = 100 μAdc)	All	$V_{(BR)EBO}$	5.0	—	V
Collector Cutoff Current (V_{CE} = 30 Vdc) (V_{CE} = 20 Vdc) (T_A = 100°Cdc)	 2N5022 2N5023	I_{CES}	 — —	 100 15	 nA μA
ON CHARACTERISTICS					
DC Current Gain(1) (I_C = 100 mA, V_{CE} = 1.0 Vdc) (I_C = 500 mA, V_{CE} = 1.0 Vdc) (I_C = 1.0 A, V_{CE} = 5.0 Vdc) (I_C = 500 ma, V_{CE} = 1.0 V, T_A = −55°C)	 2N5022 2N5023 2N5022 2N5023 2N5022 2N5023 2N5022 2N5023	h_{FE}	 15 30 25 40 25 40 10 20	 — — 100 100 — — — —	—
Collector-Emitter Saturation Voltage(1) (I_C = 100 mAdc, I_B = 10 mAdc) (I_C = 500 mAdc, I_B = 50 mAdc) (I_C = 1.0 Adc, I_B = 100 mAdc)	 2N5022 2N5023 2N5022 2N5023 2N5022 2N5023	$V_{CE(sat)}$	 — — — — — —	 0.20 0.17 0.40 0.35 0.80 0.70	 V V V

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

Characteristic		Symbol	Min	Max	Unit
Base-Emitter Saturation Voltage (I_C = 100 mAdc, I_B = 10 mAdc) (I_C = 500 mAdc, I_B = 50 mAdc) (I_C = 1.0 Adc, I_B = 100 mAdc)		$V_{BE(sat)}$	 — 0.8 —	 1.0 1.4 1.75	 V V V
SMALL-SIGNAL CHARACTERISTICS					
Collector-Base Capacitance (V_{BE} = 0.5 V, f = 100 kHz)		C_{cb}	—	25	pF
Emitter-Base Capacitance (V_{BE} = 0.5 V, f = 100 kHz)		C_{eb}	—	100	pF
Small-Signal Current Gain (I_C = 50 mA, V_{CE} = 10 V, f = 100 MHz)	2N5022 2N5023	h_{fe}	 1.7 2.0	 — —	—
SWITCHING CHARACTERISTICS					
Turn-On Time (V_{CE} = −30 V, I_C ≈ 500 mA, I_B ≈ 50 mA)		t_{on}	—	40	ns
Turn-Off Time (V_{CE} = 30 V, I_C ≈ 500 mA, I_{B1} = I_{B2} ≈ 50 mA)		t_{off}	—	90	ns

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

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