

**MAXIMUM RATINGS**

Rating	Symbol	2N718A 2N956	2N1711	Unit
Collector-Emitter Voltage	V <sub>CER</sub>	50		V <sub>dc</sub>
Collector-Base Voltage	V <sub>CBO</sub>	75		V <sub>dc</sub>
Emitter-Base Voltage	V <sub>EBO</sub>	7.0		V <sub>dc</sub>
Total Device Dissipation @ T <sub>A</sub> = 25°C Derate above 25°C	P <sub>D</sub>	500 2.86	800 4.57	mW mW/°C
Total Device Dissipation @ T <sub>C</sub> = 25°C Derate above 25°C	P <sub>D</sub>	1.8 10.3	3.0 17.15	Watts mW/°C
Operating and Storage Junction Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	- 65 to +200		°C

**THERMAL CHARACTERISTICS**

Characteristic	Symbol	2N718A 2N956	2N1711	Unit
Thermal Resistance, Junction to Ambient	R <sub>θJA</sub>	350	58	°C/W
Thermal Resistance, Junction to Case	R <sub>θJC</sub>	97	219	°C/W

**2N718A  
2N956**  
CASE 22-03, STYLE 1  
TO-18 (TO-206AA)

**2N1711**  
CASE 79-04, STYLE 1  
TO-39 (TO-205AD)

**GENERAL PURPOSE  
TRANSISTORS**  
NPN SILICON

Refer to 2N3019 for graphs.

**ELECTRICAL CHARACTERISTICS** (T<sub>A</sub> = 25°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>					
Collector-Emitter Breakdown Voltage (I <sub>C</sub> = 100 mA <sub>dc</sub> , pulsed; R <sub>BE</sub> ≤ 10 ohms)(1)	V <sub>CER(sus)</sub>	50	—	—	V <sub>dc</sub>
Collector-Base Breakdown Voltage (I <sub>C</sub> = 100 μA <sub>dc</sub> , I <sub>E</sub> = 0)	V <sub>(BR)CBO</sub>	75	—	—	V <sub>dc</sub>
Emitter-Base Breakdown Voltage (I <sub>E</sub> = 100 μA <sub>dc</sub> , I <sub>C</sub> = 0)	V <sub>(BR)EBO</sub>	7.0	—	—	V <sub>dc</sub>
Collector Cutoff Current (V <sub>CB</sub> = 60 V <sub>dc</sub> , I <sub>E</sub> = 0) (V <sub>CB</sub> = 60 V <sub>dc</sub> , I <sub>E</sub> = 0, T <sub>A</sub> = 150°C)	I <sub>CBO</sub>	—	0.001	0.01 10	μA <sub>dc</sub>
Emitter Cutoff Current (V <sub>EB</sub> = 5.0 V <sub>dc</sub> , I <sub>C</sub> = 0)	I <sub>EBO</sub>	—	—	0.010 0.005	μA <sub>dc</sub>
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**ON CHARACTERISTICS**

DC Current Gain (I <sub>C</sub> = 0.01 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> )	h <sub>FE</sub>	20	—	—	—
(I <sub>C</sub> = 0.1 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> )		20 35	—	—	
(I <sub>C</sub> = 10 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> )		35 75	—	—	
(I <sub>C</sub> = 10 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> , T <sub>A</sub> = -55°C)		20 35	—	—	
(I <sub>C</sub> = 150 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> )(1)		40 100	—	120 300	
(I <sub>C</sub> = 500 mA <sub>dc</sub> , V <sub>CE</sub> = 10 V <sub>dc</sub> )(1)		20 40	—	—	
Collector-Emitter Saturation Voltage(1) (I <sub>C</sub> = 150 mA <sub>dc</sub> , I <sub>B</sub> = 15 mA <sub>dc</sub> )	V <sub>CE(sat)</sub>	—	0.24	1.5	V <sub>dc</sub>
Base-Emitter Saturation Voltage(1) (I <sub>C</sub> = 150 mA <sub>dc</sub> , I <sub>B</sub> = 15 mA <sub>dc</sub> )	V <sub>BE(sat)</sub>	—	1.0	1.3	V <sub>dc</sub>

(1) Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.

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

Characteristic	Symbol	Min	Typ	Max	Unit
<b>SMALL-SIGNAL CHARACTERISTICS</b>					
Current-Gain — Bandwidth Product ( $I_C = 50 \text{ mAdc}$ , $V_{CE} = 10 \text{ Vdc}$ , $f = 20 \text{ MHz}$ )	$f_T$	60 70	300 300	—	MHz
Output Capacitance ( $V_{CB} = 10 \text{ Vdc}$ , $I_E = 0$ , $f = 1 \text{ MHz}$ )	$C_{obo}$	—	4.0	25	pF
Input Capacitance ( $V_{EB} = 0.5 \text{ Vdc}$ , $I_C = 0$ , $f = 1 \text{ MHz}$ )	$C_{ibo}$	—	20	80	pF
Input Impedance ( $I_C = 1.0 \text{ mAdc}$ , $V_{CB} = 5.0 \text{ Vdc}$ , $f = 1.0 \text{ kHz}$ ) ( $I_C = 5.0 \text{ mAdc}$ , $V_{CB} = 10 \text{ Vdc}$ , $f = 1.0 \text{ kHz}$ )	$h_{ib}$	24 4.0	—	34 8.0	ohms
Voltage Feedback Ratio ( $I_C = 1.0 \text{ mAdc}$ , $V_{CB} = 5.0 \text{ Vdc}$ , $f = 1.0 \text{ kHz}$ )  ( $I_C = 5.0 \text{ mAdc}$ , $V_{CB} = 10 \text{ Vdc}$ , $f = 1.0 \text{ kHz}$ )	$h_{rb}$	— —	— —	3.0 5.0 3.0 5.0	$\times 10^{-4}$
Small-Signal Current Gain ( $I_C = 1.0 \text{ mAdc}$ , $V_{CE} = 5.0 \text{ Vdc}$ , $f = 1.0 \text{ kHz}$ )  ( $I_C = 5.0 \text{ mAdc}$ , $V_{CE} = 10 \text{ Vdc}$ , $f = 1.0 \text{ kHz}$ )	$h_{fe}$	30 50	— —	100 200	—
Output Admittance ( $I_C = 1.0 \text{ mAdc}$ , $V_{CB} = 5.0 \text{ Vdc}$ , $f = 1.0 \text{ kHz}$ ) ( $I_C = 5.0 \text{ mAdc}$ , $V_{CB} = 10 \text{ Vdc}$ , $f = 1.0 \text{ kHz}$ )	$h_{ob}$	0.05 0.05	— —	0.5 0.5	$\mu\text{mhos}$
Noise Figure ( $I_C = 300 \mu\text{Adc}$ , $V_{CE} = 10 \text{ Vdc}$ , $f = 1.0 \text{ kHz}$ )	NF	— —	— —	12 8.0	dB