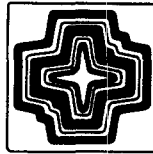
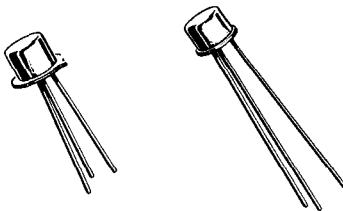


2N718A (SILICON)
2N956
2N1613
2N1711



$V_{CER} = 50\text{ V}$
 $f_T = 300\text{ MHz Typ}$

(JAN 2N1613 AND 2N1711 Available)



CASE 22
(TO-18)

2N718A
2N956

CASE 31
(TO-5)

2N1613
2N1711

Collector connected to case

NPN silicon annular Star transistors for high-speed switching and DC to UHF amplifier applications.

MAXIMUM RATINGS

Rating	Symbol	2N718A 2N956	2N1613 2N1711	Unit
Collector-Emitter Voltage	V_{CER}	50		Vdc
Collector-Base Voltage	V_{CB}	75		Vdc
Emitter-Base Voltage	V_{EB}	7.0		Vdc
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ Derate above 25°C	P_D	500 2.86	800 4.57	mW mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ Derate above 25°C	P_D	1.8 10.3	3.0 17.1	Watts mW/ $^\circ\text{C}$
Operating and Storage Junction Temperature Range	T_J, T_{stg}	-65 to +200		$^\circ\text{C}$

2N718A, 2N956, 2N1613, 2N1711 (continued)

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

Characteristic	Symbol	Min	Typ	Max	Unit
OFF CHARACTERISTICS					
Collector-Emitter Breakdown Voltage ($I_C = 100 \text{ mAdc}$, pulsed; $R_{BE} \leq 10 \text{ ohms}$)	BV_{CER}	50	-	-	Vdc
Collector-Base Breakdown Voltage ($I_C = 100 \text{ } \mu\text{A}$ dc, $I_E = 0$)	BV_{CBO}	75	-	-	Vdc
Emitter-Base Breakdown Voltage ($I_E = 100 \text{ } \mu\text{A}$ dc, $I_C = 0$)	BV_{EBO}	7.0	-	-	Vdc
Collector Cutoff Current ($V_{CB} = 60 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = 60 \text{ Vdc}$, $I_E = 0$, $T_A = 150^\circ\text{C}$)	I_{CBO}	-	0.001	0.01	μA dc
Emitter Cutoff Current ($V_{BE} = 5.0 \text{ Vdc}$, $I_C = 0$)	I_{EBO}	-	-	0.010	μA dc
				0.005	

ON CHARACTERISTICS

DC Current Gain ($I_C = 0.01 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$)	2N956, 2N1711	h_{FE}	20	-	-	-
($I_C = 0.1 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$)	2N718A, 2N1613					
($I_C = 10 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$)	2N956, 2N1711	35	-	-	-	-
($I_C = 10 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$)	2N718A, 2N1613	35	-	-	-	-
($I_C = 10 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$, $T_A = -55^\circ\text{C}$)	2N956, 2N1711	75	-	-	-	-
($I_C = 10 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$, $T_A = -55^\circ\text{C}$)	2N718A, 2N1613	20	-	-	-	-
($I_C = 150 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$)*	2N956, 2N1711	35	-	-	-	-
($I_C = 150 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$)*	2N718A, 2N1613	40	-	-	120	-
($I_C = 500 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$)*	2N956, 2N1711	100	-	-	300	-
($I_C = 500 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$)*	2N718A, 2N1613	20	-	-	-	-
($I_C = 500 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$)*	2N956, 2N1711	40	-	-	-	-
Collector-Emitter Saturation Voltage* ($I_C = 150 \text{ mA}$ dc, $I_B = 15 \text{ mA}$ dc)		$V_{CE(sat)}^*$	-	0.24	1.5	Vdc
Base-Emitter Saturation Voltage* ($I_C = 150 \text{ mA}$ dc, $I_B = 15 \text{ mA}$ dc)		$V_{BE(sat)}^*$	-	1.0	1.3	Vdc

SMALL-SIGNAL CHARACTERISTICS

Current-Gain-Bandwidth Product ($I_C = 50 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$, $f = 20 \text{ MHz}$)	2N718A, 2N1613 2N956, 2N1711	f_T	60	300	-	MHz
			70	300		
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 100 \text{ kHz}$)		C_{ob}	-	4.0	25	pF
Input Capacitance ($V_{BE} = 0.5 \text{ Vdc}$, $I_C = 0$, $f = 100 \text{ kHz}$)		C_{ib}	-	20	80	pF
Input Impedance ($I_C = 1.0 \text{ mA}$ dc, $V_{CB} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)		h_{ib}	24	-	34	ohms
($I_C = 5.0 \text{ mA}$ dc, $V_{CB} = 10 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)			4.0	-	8.0	
Voltage Feedback Ratio ($I_C = 1.0 \text{ mA}$ dc, $V_{CB} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	2N718A, 2N1613 2N956, 2N1711	h_{rb}	-	-	3.0	$\times 10^{-4}$
($I_C = 5.0 \text{ mA}$ dc, $V_{CB} = 10 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	2N718A, 2N1613 2N956, 2N1711		-	-	5.0	
Small-Signal Current Gain ($I_C = 1.0 \text{ mA}$ dc, $V_{CE} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	2N718A, 2N1613 2N956, 2N1711	h_{ie}	30	-	100	-
($I_C = 5.0 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	2N718A, 2N1613 2N956, 2N1711		50	-	200	
			35	-	150	
			70	-	300	
Output Admittance ($I_C = 1.0 \text{ mA}$ dc, $V_{CB} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)		h_{ob}	0.1	-	0.5	μmho
($I_C = 5.0 \text{ mA}$ dc, $V_{CB} = 10 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)			0.1	-	1.0	
Noise Figure ($I_C = 300 \text{ } \mu\text{A}$ dc, $V_{CE} = 10 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	2N718A, 2N1613 2N956, 2N1711	NF	-	-	12	dB
			-	-	8.0	

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