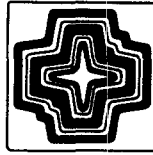


2N903-2N991

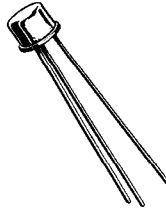
TYPE	MATERIAL	POLARITY	REPLACE- MENT	PAGE NUMBER	USE	MAXIMUM RATINGS						ELECTRICAL CHARACTERISTICS											
						P _D @ 25°C	Ref Point	T _J °C	V _{CB} (volts)	V _{CE-} (volts)	Subscript	h _{FE} @ I _C		V _{CE(SAT)} @ I _C		h _{FE}	Subscript	f _T	Subscript				
						(mW)		(°C)	(V)	(V)		(min)	(max)	Units	(volts)	Units		Units					
2N903	G	N			AFA	150M	A	175	45	30	O				1.0	5.0M	18	E	2.0M	T			
2N904	G	N			AFA	150M	A	175	45	30	O				1.0	5.0M	18	E	8.0M	T			
2N905	G	N			AFA	150M	A	175	45	30	O				1.0	5.0M	36	E	2.0M	T			
2N906	G	N			AFA	150M	A	175	45	30	O				1.0	5.0M	76	E	2.0M	T			
2N907	S	N			RFA	0.15W	A	175	45	30	O	20	55	10M	1.0	5.0M	19	E	12M	T			
2N908	S	N			RFA	0.15W	A	175	45	30	O	45	150	10M	1.0	5.0M	39	E	25M	T			
2N909	S	N	2N2222	8-108	RFA	400M	A	175	60	30	R	110	350	50M	0.5	10M	40	E	50M	T			
2N910	S	N			AFA	500M	A	200	100	80	R	75		10M	0.4	10M	76	E	60M	T			
2N911	S	N			AFA	500M	A	200	100	80	R	35		10M	0.4	10M	36	E	50M	T			
2N912	S	N			AFA	500M	A	200	100	80	R	15		10M	0.4	10M	18	E	40M	T			
2N914	S	N		8-67	HSS	360M	A	200	40	20	R	30	120	10M	0.7	200M		E	300M	T			
2N914A	S	N			HSS	360M	A	200	40	20	R	30	120	10M	0.4	200M		E	300M	T			
2N915	S	N		8-69	RFA	360M	A	200	70	50	O	50	200	10M	1.0	10M	50	E	250M	T			
2N916	S	N		8-71	RFA	360M	A	200	45	25	O	50	200	10M	0.5	10M	50	E	300M	T			
2N916A	S	N			RFA	360M	A	200	45	25	O	50	200	10M	0.5	10M	50	E	300M	T			
2N917	S	N			RFA	200M	A	200	30	15	O	20	200	3.0M	0.5	3.0M		E	500M	T			
2N917A	S	N			RFA	200M	A	200	30	15	O	20	200	3.0M	0.4	10M		E	600M	T			
2N918	S	N		9-15	RFA	200M	A	200	30	15	O	20		3.0M	0.4	10M		E	600M	T			
2N919	S	N	2N834	8-54	HSS	0.36W	A	200	25	15	O	20	60	10M	0.2	10M		E	200M	T			
2N920	S	N	2N834	8-54	HSS	0.36W	A	200	25	15	O	40	120	10M	0.2	10M		E	200M	T			
2N921	S	N	2N834	8-54	HSS	0.36W	A	200	50	20	O	20	60	10M	0.3	10M		E	200M	T			
2N922	S	N	2N834	8-54	HSS	0.36W	A	200	50	20	O	40	120	10M	0.3	10M		E	200M	T			
2N923	S	P			AFA	0.25W	A	200	40	25	O			0.5	5.0M		E	0.8M	B				
2N924	S	P			AFA	0.25W	A	200	40	25	O			0.5	5.0M		E	0.8M	B				
2N925	S	P			AFA	0.25W	A	200	50	40	O			0.5	5.0M	10	E	0.8M	B				
2N926	S	P			AFA	0.25W	A	200	50	40	O			0.5	5.0M	20	E	0.8M	B				
2N927	S	P			AFA	0.25W	A	200	70	60	O			0.5	5.0M	8.0	E	0.8M	B				
2N928	S	P			AFA	0.25W	A	200	70	60	O			0.5	5.0M	18	E	0.8M	B				
2N929	S	N		8-72	AFA	600M	C	175	45	45	O	40	120	10*	1.0	10M	150	E	1.0M	B			
2N929A	S	N			AFA	0.5W	A	200	60	45	O	40	120	10*	0.5	10M	60	E	45M	T			
2N930	S	N		8-72	AFA	600M	C	175	45	45	O	100	300	10*	1.0	10M	150	E	1.0M	B			
2N930A	S	N			AFA	0.5W	A	200	60	45	O	100	300	10*	0.5	10M	150	E	45M	T			
2N934	G	P	2N965	8-74	HSS	150M	A	85	13	12	O	40		40M	0.3	40M		E	35M	T			
2N935	S	P			AFA	0.25W	A	160	50	35	O	18	44		0.3	5.0M		E					
2N936	S	P			AFA	0.25W	A	160	50	35	O	18	44		0.5	5.0M		E					
2N937	S	P			AFA	0.25W	A	160	50	30	O	36	88		0.6	5.0M		E					
2N938	S	P			AFA	0.25W	A	175	40	35	O				0.3	5.0M	9.0	E	1.0M	B			
2N939	S	P			AFA	0.25W	A	175	40	35	O				0.3	5.0M	18	E	2.0M	B			
2N940	S	P			AFA	0.25W	A	175	40	35	O				0.3	5.0M	36	E	2.0M	B			
2N941	S	P			CHP	0.25W	A	175	25	8	U	10		1.0M		25	E	1.0M	B				
2N942	S	P			CHP	0.25W	A	175	25	8	U	10		1.0M		25	E	1.0M	B				
2N943	S	P			CHP	0.25W	A	175	40	18	O	10			0.003	0.004	25	E	1.0M	B			
2N944	S	P			CHP	0.25W	A	175	40	18	O	10			0.004	0.005	25	E	1.0M	B			
2N945	S	P			CHP	0.25W	A	175	50	50	O	10			0.005	0.005	25	E	1.0M	B			
2N946	S	P			CHP	0.25W	A	175	80	80	O	10			0.005	0.005	25	E	1.0M	B			
2N947	S	N	2N834	8-54	MSA	360M	A	150	20	15	R	20		10M	0.4	5.0M		E	200M	T			
2N948																							
chru					Thyristors, see Table on Page 1-154																		
2N951	G	N			HSS	150M	A	100	12	8.0	O	30		30M	0.5	30M							
2N955	G	N			HSS	150M	A	100	12	8.0	O	30		30M	0.3	30M							
2N955A	G	N	2N2222	8-108	RFA	500M	A	200	75	50	R	100	300	150M	1.5	150M	50	E	70M	T			
2N956	G	N	2N2501	8-148	RFA	250M	A	150	40	20	O	45		10M	1.5	10M							
2N957	G	N			RFA	250M	A	150	40	20	O	45		10M	1.5	10M							
2N958	S	N			HSS	0.25W	C	150	25	15	O	20		10M	0.2	10M							
2N959	S	N			HSS	0.25W	C	150	25	15	O	40		10M	0.2	10M							
2N960	G	P		8-74	HSS	150M	A	100	15	15	S	20		10M	0.2	10M							
2N961	G	P		8-74	HSS	150M	A	100	12	12	S	20		10M	0.2	10M							
2N962	G	P		8-74	HSS	150M	A	100	12	12	S	20		10M	0.2	10M							
2N963	G	P		8-76	HSS	150M	A	100	12	12	S	20		10M	0.2	10M							
2N964	G	P		8-74	HSS	150M	A	100	15	15	S	40		10M	0.18	10M							
2N964A	G	P		8-79	HSS	150M	A	100	15	15	S	40		10M	0.18	10M							
2N965	G	P		8-74	HSS	150M	A	100	12	12	S	40		10M	0.18	10M							
2N966	G	P		8-74	HSS	150M	A	100	12	12	S	40		10M	0.18	10M							
2N967	G	P		8-76	HSS	150M	A	100	12	12	S	40		10M	0.2	10M							
2N968	G	P		8-85	HSS	150M	A	100	15	15	S	17		10M	0.25	10M							
2N969	G	P		8-85	HSS	150M	A	100	12	12	S	17		10M	0.25	10M							
2N970	G	P		8-85	HSS	150M	A	100	12	12	S	17		10M	0.25	10M							
2N971	G	P		8-85	HSS	150M	A	100	7.0	7.0	S	17		10M	0.25	10M							
2N972	G	P		8-85	HSS	150M	A	100	15	15	S	40		10M	0.25	10M							
2N973	G	P		8-85	HSS	150M	A	100	12	12	S	40		10M	0.25	10M							
2N974	G	P		8-85	HSS	150M	A	100	12	12	S	40		10M	0.25	10M							
2N975	G	P		8-85	HSS	150M	A	100	7.0	7.0	S	40		10M	0.25	10M							
2N976	G	P	2N964	8-74	HSS	100M	A	100	15	10	O	30		20M	0.17	20M							
2N977	G	P	2N964	8-74	HSS	150M	A	100	15	10													

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)

CASE 31
(TO-5)

2N718A
2N956

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
	2N718A, 2N1613 2N956, 2N1711	-	-	0.005	

ON CHARACTERISTICS

DC Current Gain ($I_C = 0.01 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 0.1 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 10 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 10 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$, $T_A = -55^\circ\text{C}$) ($I_C = 150 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$)* ($I_C = 500 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$)*	2N956, 2N1711 2N718A, 2N1613 2N956, 2N1711 2N718A, 2N1613 2N956, 2N1711 2N718A, 2N1613 2N956, 2N1711 2N718A, 2N1613 2N956, 2N1711	h_{FE}	20 20 35 35 75 20 35 40 100 20 40	- - - - - - - - - - -	- - - - - - - - - - -	- - - - 120 300 - -
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 70	300 300	-	MHz
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, $V_{CB} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$) ($I_C = 5.0 \text{ mA}$ dc, $V_{CB} = 10 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)		h_{ib}	24 4.0	- -	34 8.0	ohms
Voltage Feedback Ratio ($I_C = 1.0 \text{ mA}$ dc, $V_{CB} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$) ($I_C = 5.0 \text{ mA}$ dc, $V_{CB} = 10 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	2N718A, 2N1613 2N956, 2N1711 2N718A, 2N1613 2N956, 2N1711	h_{rb}	- - - -	- - - -	3.0 5.0 3.0 5.0	$\times 10^{-4}$
Small-Signal Current Gain ($I_C = 1.0 \text{ mA}$ dc, $V_{CE} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$) ($I_C = 5.0 \text{ mA}$ dc, $V_{CE} = 10 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)	2N718A, 2N1613 2N956, 2N1711 2N718A, 2N1613 2N956, 2N1711	h_{ie}	30 50 35 70	- - - -	100 200 150 300	-
Output Admittance ($I_C = 1.0 \text{ mA}$ dc, $V_{CB} = 5.0 \text{ Vdc}$, $f = 1.0 \text{ kHz}$) ($I_C = 5.0 \text{ mA}$ dc, $V_{CB} = 10 \text{ Vdc}$, $f = 1.0 \text{ kHz}$)		h_{ob}	0.1 0.1	- -	0.5 1.0	μmho
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 8.0	dB

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