

TYPE	MATERIAL	POLARITY	REPLACE- MENT	PAGE NUMBER	USE	MAXIMUM RATINGS					ELECTRICAL CHARACTERISTICS													
						P _D @ 25°C	T _J Ref Point °C	V _{CB} (volts)	V _{CE—} (volts)	I _C Subscript	f _{FE} @ f _C (min) (max)	V _{CE(SAT)} @ I _C Units (volts)	f _r — Units	f _— Subscript	f _— Units	f _— Subscript								
2N635A 2N636 2N636A 2N637 2N637A 2N637B 2N638 2N638A 2N638B 2N639 2N639A 2N639B	G N G P G P G P G P G P	N N N P P P P P P P P P			MSA HSA MSA PMS PMS PMS PMS PMS PMS PMS PMS PMS	2.5M 1.50M 2.5M 60W 60W 60W 60W 60W 60W 60W 37W 37W	J A J C C C C C C C C C	85 25 85 100 100 100 100 100 100 100 100 100 100	20 20 25 35 65 75 35 65 75 75 65 35 75	R O R C R C R C R C R C R	80 35 100 100 100 30 20 40 40 15 15	240 200M 300 60 60 30 60 40 40 40 2.5 3.0A	10M 200M 10M 3.0A 3.0A 3.0A 3.0A 3.0A 3.0A 3.0A 3.0A 3.0A	0.2 1.5 0.15 1.5 1.5 1.5 2.0 2.0 2.0 2.5 2.5	10M 3.0A 10M 3.0A 3.0A 3.0A 3.0A 3.0A 3.0A 3.0A 3.0A 3.0A				10M 15M 15M	B B B				
2N640 2N641 2N642 2N643 2N644 2N645 2N646 2N647 2N649 2N650 2N650A 2N651	G P G P G P G N G N G P G P	P P P P P P N N N N P P			AFC AFC AFC MSS MSS MSS AFC AFC AFC AFA AFA AFA	80M 80M 80M 120M 120M 120M 100M 100M 100M 0.2W 0.2W 0.2W	A A A A A A A A A A A A A	71 71 71 34 30 30 25 25 25 100 45 100	A A A A A A A A A A A A A	34 34 34 30 30 30 25 25 18 30 30 30									20 20 20 10M 10M 10M 150 30M	T T T T T T T T T E E E				
2N651A 2N652 2N652A 2N653 2N654 2N655 2N656 2N656A 2N657 2N657A 2N658 2N659	G P G P G P S N S N G P G P	P P P P P P N N N N P P			AFA AFA AFA AFA AFA AFA AFA AFA AFA AFA MSA MSA	0.2W 0.2W 0.2W 0.2W 0.2W 0.2W 4.0W 5.0W 4.0W 5.0W 167M 167M	A A A A A A C C C C A A	100 100 100 100 100 100 200 200 200 200 85 85	45 45 45 30 30 30 60 60 100 100 25 25	R R R R R R O O O O O O	45 80 80 20 20 20 30 30 30 30 25 14							10M 10M 10M 10M 10M 10M 200M 200M 200M 200M 3.45 3.5	50 50M 50M 50M 50M 50M 50 30 30 30 250M	E E E E E E E E E E B B				
2N660 2N661 2N662 2N663 2N665 2N669 2N670 2N671 2N672 2N673 2N674 2N675	G P G P G P G P G P G P G P	P P P P P P P P P P P P			MSA MSA MSA PMS PMS LPA AFA AFA AFA AFA AFA AFA	167M 167M 167M 35W 35W 62.5W 300M 800M 300M 800M 300M 800M	A A A C C C A A A A A A	85 85 85 100 95 100 85 85 85 85 85 85	25 25 25 25 25 40 40 25 25 75 75	O O O O O S V V V V S	60 80 30 25 40 40 40 40 40 40 40 40							3.5 3.5 3.4 1.0 1.9 0.9 1.0 0.5A 1.0A 1.0A 0.2 0.2 0.35 0.35	400M 550M 180M 3.0A 3.0A 3.0A 500K 500K 400M 400M 1.0A 1.0A 1.0A	10M 15M 4.0M 15K 20K 3.0K 500K 500K	B B B E E E B B B B B B B			
2N677 2N677A 2N677B 2N677C 2N678 2N678A 2N678B 2N678C 2N679 2N680 2N681 thru	G P G P G P G P G P G N G P	P P P P P P P P P P P N P			LPA LPA LPA LPA LPA LPA LPA LPA MSS AFA	90W 90W 90W 90W 90W 90W 90W 90W 150M 150M	C C C C C C C C A A	100 100 100 100 100 100 100 100 85 75	S S S S S S S S X S	50 60 70 80 50 60 60 70 20 20	20 20 20 20 20 20 20 20 20 18								10A 10A 10A 10A 10A 10A 10A 10A 30M 50M	1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	10A 10A 10A 10A 10A 10A 10A 10A 10M 10M	15 E	2.0M	B
Thyristors, see Table on Page 1-154																								
2N692 2N694 2N695 2N696 2N696A 2N697 2N697A 2N698 2N699 2N699A 2N699B 2N700	G P G P S N S N S N S N G P	P P N N N P N N N N P P			RFA HSS MSA MSA MSA MSA MSA MSA MSA MSA RFA	0.1W 75M 600M 800M 600M 800M 800M 600M 800M 800M 870M 75M	A A A A A A A A A A A	100 100 175 300 175 200 200 175 300 200 200	30 15 60 60 60 60 60 120 80 120 120 100	O O R R R R R R R R S	15 25 20 20 40 40 40 40 40 40 1.5							2.0M 10M 150M 150M 150M 150M 150M 150M 150M 150M 2.0M	1.0 1.5 1.5 1.5 1.5 1.2 5.0 5.0 5.0 5.0	50M 150M 150M 150M 150M 50M 150M 150M 150M 50M	0.9 15 25 15 35 35 4.0	B E E E E E E E E	340M 40M 40M 40M 50M 40M 50M 50M 60M 270M	T T T T T T T T T T
2N700A 2N702 2N703 2N705 2N705A 2N706 2N706A 2N706B 2N706C 2N707 2N707A 2N708 2N708A 2N709 2N709A 2N710	G P S N G P G P S N S N S N S N G P	P N N P P N N N N N N N N N N P			RFA HSS HSS HSS HSS HSS HSA HSS HSS HSA HSS HSS HSS HSS HSS HSS	75M 300M 300M 300M 150M 300M 300M 300M 300M 300M 500M 360M 360M 300M 300M 300M	A A A A A A A A A A A A A A A A	100 175 175 100 100 175 175 175 200 175 175 200 200 200 200 200	25 25 25 15 15 25 25 25 40 40 40 40 50 15 15	O O O S R R R R R R R R R R R	1.5 60 100 25 25 25 25 20 20 20 20 30 30 20 30							6.0M 10M 10M 10M 10M 10M 10M 10M 10M 10M 10M 10M 10M 10M 10M 10M	0.5 0.5 0.3 0.3 0.3 0.6 0.6 0.4 0.4 0.4 0.4 0.6 0.4 0.3 0.3 0.3	10M 10M 10M 10M 10M 10M 10M 10M 10M 10M 10M 10M 10M 10M 10M	4.0 E	360M 70M 70M 200M 200M 200M 200M 70M 300M 300M 600M 800M	T T T T T T T T T T T T T T T	

2N706, A, B (SILICON)
2N706 JAN
2N753

$V_{CE0} = 15\text{ V}$
 $h_{FE} = 20\text{-}40\text{ min}$
 $f_T = 400\text{ MHz}$



NPN silicon annular switching transistors for high-speed switching applications.

CASE 22
(TO-18)

Collector connected to case

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Base Voltage	V_{CB}	25	Volts
Collector-Emitter Voltage *	V_{CER}^*	20	Volts
Emitter-Base Voltage	V_{EB}	3 5 5 5	Volts
		2N706 2N706A 2N706B 2N753	
Junction Temperature	T_J	175	$^{\circ}\text{C}$
Storage Temperature	T_{stg}	-65 to +175	$^{\circ}\text{C}$
Total Device Dissipation at 25 $^{\circ}\text{C}$ Case Temperature (Derate 6.67 mW/ $^{\circ}\text{C}$ above 25 $^{\circ}\text{C}$)	P_D	1.0	Watt
Total Device Dissipation at 25 $^{\circ}\text{C}$ Ambient Temperature (Derate 2 mW/ $^{\circ}\text{C}$ above 25 $^{\circ}\text{C}$)	P_D	0.3	Watt
Total Device Dissipation at 100 $^{\circ}\text{C}$ Case Temperature (Derate 6.67 mW/ $^{\circ}\text{C}$ above 100 $^{\circ}\text{C}$)	P_D	0.5	Watt

*Refers to collector breakdown voltage in the high current region when $R_{be} = 10\Omega$

2N706,A,B, 2N753 (continued)

ELECTRICAL CHARACTERISTICS (At 25°C unless otherwise noted)

Characteristic	Type	Symbol	Min	Typ	Max	Unit
Collector Cutoff Current ($V_{CB} = 15V_{dc}$, $I_E = 0$) ($V_{CB} = 15V_{dc}$, $I_E = 0$, $T_A = 150^\circ C$) ($V_{CB} = 25V_{dc}$, $I_E = 0$)	All Types All Types 2N706A, 2N706B, 2N753	I_{CBO}	-	0.005 3	0.5 30 10	μA_{dc}
Collector-Emitter Cutoff Current ($V_{CE} = 20V_{dc}$, $R_{be} = 100k$)	2N706A, 2N706B, 2N753	I_{CER}	-	-	10	μA_{dc}
Emitter Cutoff Current ($V_{EB} = 3V_{dc}$, $I_C = 0$) ($V_{EB} = 5V_{dc}$, $I_C = 0$)	2N706 2N706A, 2N706B, 2N753	I_{EBO}	-	-	10 10	μA_{dc}
Collector-Emitter Breakdown Voltage* ($I_C = 10mA_{dc}$, $I_B = 0$)	All Types	BV_{CEO}^*	15	24	-	Vdc
Collector-Emitter Breakdown Voltage* ($R = 10\text{ ohms}$, $I_C = 10mA_{dc}$)	All Types	BV_{CER}^*	20	48	-	Vdc
Forward-Current Transfer Ratio* ($I_C = 10mA_{dc}$, $V_{CE} = 1V_{dc}$)	2N706 2N706A, 2N706B, 2N753	h_{FE}^*	20 20 40	40 40 -	- 60 120	
Base-Emitter Voltage* ($I_C = 10mA_{dc}$, $I_B = 1mA_{dc}$)	2N706 2N706A, 2N706B, 2N753	$V_{BE(sat)}^*$	- 0.7	0.75 0.75	0.9 0.9	Vdc
Collector Saturation Voltage* ($I_C = 10mA_{dc}$, $I_B = 1mA_{dc}$) ($I_C = 50mA_{dc}$, $I_B = 5mA_{dc}$)	2N706, 2N706A 2N706B 2N753 2N753	$V_{CE(sat)}^*$	- - - -	0.3 0.3 0.18 0.3	0.6 0.4 0.6 -	Vdc
Collector Capacitance ($V_{CB} = 5V_{dc}$, $I_E = 0$) ($V_{CB} = 10V_{dc}$, $I_E = 0$)	2N706A, 2N706B, 2N753 2N706	C_{ob}	- -	4.5 5	5 6	pF
Small-Signal Forward Current Transfer Ratio ($V_{CE} = 15V_{dc}$, $I_E = 10mA_{dc}$, $f = 100MHz$)	All types	h_{fe}	2	4	-	-
Current Gain-Bandwidth Product ($V_{CE} = 15V_{dc}$, $I_E = 10mA_{dc}$, $f = 100\text{ MHz}$)	All types	f_T	-	400	-	MHz
Base Resistance ($V_{CE} = 15V_{dc}$, $I_E = 10mA_{dc}$, $f = 300\text{ MHz}$)	2N706B	r_b'	-	39	50	ohms
Charge Storage Time Constant	2N706 2N706A 2N753	τ_s^{**}	- - -	16 16 19	60 25 35	ns
Storage Time	2N706B	t_s	-	19	25	ns
Turn-On Time	All types	t_{on}^{**}	-	30	40	ns
Turn-Off Time	All Types	t_{off}^{**}	-	50	75	ns

* Pulse Test: $PW \leq 12\text{ ms}$, Duty Cycle $\leq 2\%$

** Switching Times Measured with Tektronix Type R Plug-In (50Ω Internal Impedance) and Circuits Shown Below.

