

2N2893-2N2967

TYPE	MATERIAL	POLARITY	REPLACE- MENT	PAGE NUMBER	USE	MAXIMUM RATINGS					ELECTRICAL CHARACTERISTICS										
						P _D	Ref Point	T _J	V _{CB}	V _{CE} —	Subscript	h _{FE} @ I _C		V _{CE(SAT)} @ I _C	h _{FE}	Subscript	f _T	Subscript			
						@ 25°C	°C	(volts)	(volts)	(min)		(max)	Units						Units	Units	Units
2N2893	S	N		8-165	PMS	30W	C	200	100	80	0	50	150	1.0A	0.5	1.0A	50	E	30M	T	T
2N2894	S	N			MSS	360M	A	200	12	12	0	40	150	30M	0.15	10M			400M	T	T
2N2894A	S	N			PMS	360M	A	200	12	12	S	40		30M					800M	T	T
2N2895	S	N			MSA	500M	A	200	120	65	0	40	120	150M	0.6	150M	50	E	120M	T	T
2N2896	S	N			MSA	500M	A	200	140	90	0	60	200	150M	0.6	150M	50	E	120M	T	T
2N2897	S	N			MSA	500M	A	200	60	45	0	50	200	150M	1.0	150M	50	E	120M	T	T
2N2898	S	N			MSA	500M	A	200	120	65	0	40	120	150M	0.6	150M	50	E	120M	T	T
2N2899	S	N			MSA	500M	A	200	140	90	0	60	200	150M	0.6	150M	50	E	120M	T	T
2N2900	S	N			MSA	500M	A	200	60	45	0	50	200	150M	1.0	150M	50	E	120M	T	T
2N2901	S	N			CHP	0.36W	A	200	20	10	0	30		10M	0.15	10M			300M	T	T
2N2902	S	N			LPA	40W	C	200	120	120	0	30	90	500M	7.5	500M	30	E	2.0M	T	T
2N2903	S	N	2N2917	11-27	DFA	600M	C	200	60	30	0	125	625	1.0M	1.0	5.0M	150	E	60M	T	T
2N2903A	S	N	2N2915	11-27	DFA	600M	C	200	60	30	0	125	625	1.0M	1.0	5.0M	150	E	60M	T	T
2N2904	S	N		8-169	HSS	3.0W	C	200	60	40	0	40	120	150M	0.4	150M			200M	T	T
2N2904A	S	N		8-169	HSS	3.0W	C	200	60	60	0	40	120	150M	0.4	150M			200M	T	T
2N2905	S	N		8-169	HSS	3.0W	C	200	60	40	0	100	300	150M	0.4	150M			200M	T	T
2N2905A	S	N		8-169	HSS	3.0W	C	200	60	60	0	100	300	150M	0.4	150M			200M	T	T
2N2906	S	N		8-169	HSS	1.8W	C	200	60	40	0	40	120	150M	0.4	150M			200M	T	T
2N2907	S	N		8-169	HSS	1.8W	C	200	60	40	0	100	300	150M	0.4	150M			200M	T	T
2N2907A	S	N		8-169	HSS	1.8W	C	200	60	60	0	100	300	150M	0.4	150M			200M	T	T
2N2908	S	N			LPA	75W	C	200	80	80	R	12	60	1.0A	1.0	1.0A	10	E	1.0M	T	T
2N2909	S	N			HSA	0.4W	A	200	60	40	0	40	120	0.15A	0.25	0.15A			50M	T	T
2N2910	S	N	2N3409	11-33	DFA	0.3W	A	200	45	25	0	70		0.1M	1.0	10M	50	E	11M	T	T
2N2911	S	N	2N3766	7-142	PMS	5.0W	C	200	150	125	0	20	60	1.0A	0.3	1.0A			1.0M	T	T
2N2912	G	P		7-97	PMS	75W	C	110	15	6.0	0	75		10A	0.5	25A			20M	T	T
2N2913	S	N		11-27	DFA	300M	A	200	45	45	0	60	240	10*	0.35	1.0M			60M	T	T
2N2914	S	N		11-27	DFA	300M	A	200	45	45	0	150	600	10*	0.35	1.0M			60M	T	T
2N2915	S	N		11-27	DFA	300M	A	200	45	45	0	60	240	10*	0.35	1.0M			60M	T	T
2N2915A	S	N			AFA	300M	A	200	45	45	0						240	E	60M	T	T
2N2916	S	N		11-27	DFA	300M	A	200	45	45	0	150	600	10*	0.35	1.0M			60M	T	T
2N2916A	S	N			AFA	300M	A	200	45	45	0						600	E	60M	T	T
2N2917	S	N		11-27	DFA	0.3W	A	200	45	45	0	60	240	10*	0.35	1.0M			60M	T	T
2N2918	S	N		11-27	DFA	0.3W	A	200	45	45	0	150	600	10*	0.35	1.0M			60M	T	T
2N2919	S	N		11-27	DFA	0.3W	A	200	60	60	0	60	240	10*	0.35	1.0M			60M	T	T
2N2919A	S	N			AFA	300M	A	200	60	60	0						240	E	60M	T	T
2N2920	S	N		11-27	DFA	0.3W	A	200	60	60	0	150	600	10*	0.35	1.0M			60M	T	T
2N2920A	S	N			AFA	300M	A	200	60	60	0						600	E	60M	T	T
2N2921	S	N			AFA	0.2W	A	125	25	25	0						35	E	35	T	T
2N2922	S	N			AFA	0.2W	A	125	25	25	0						90	E	90	T	T
2N2923	S	N	MPS6512	5-109	AFA	0.2W	A	125	25	25	0						150	E	150	T	T
2N2924	S	N	MPS2923	5-84	AFA	0.2W	A	125	25	25	0						235	E	235	T	T
2N2924	S	N	MPS2924	5-84	AFA	0.2W	A	125	25	25	0						35	E	35	T	T
2N2925	S	N	MPS2925	5-84	AFA	0.2W	A	125	25	25	0						25	E	25	T	T
2N2926	S	N	MPS2926	5-85	AFA	0.2W	A	125	18	18	0	30	130	50M	0.25	50M	0.10		100M	T	T
2N2927	S	N			MNS	800M	A	200	25	25	0	30	130	50M	0.25	50M			400M	T	T
2N2928	G	P			RFA	150M	A	100	15	13	0	0.8	200	2.0M	0.5	50M			800M	T	T
2N2929	G	P		9-33	RFA	750M	C	100	25	10	0	10	100	10M	0.5	50M			4.0M	T	T
2N2930	G	P	2N3427	6-41	MSS	250M	A	100	30	12	0	60	420	10M	0.25	100M	30	E	20M	T	T
2N2931	S	N			AFC	50M	A	125	5.0	5.0	0	70		50M	0.45	50M				T	T
2N2932	S	N			AFC	50M	A	125	5.0	5.0	0	50		50M	0.45	50M	70	E	20M	T	T
2N2933	S	N			AFC	50M	A	125	45	30	0	50		50M	0.45	50M	45	E	20M	T	T
2N2934	S	N			AFC	50M	A	125	45	30	0	70		50M	0.45	50M	30	E	20M	T	T
2N2935	S	N			AFC	50M	A	125	45	30	0	70		50M	0.45	50M	70	E	20M	T	T
2N2936	S	N			LPA	300M	A	175	60	55	0	100	300	10*	0.3	2.0M	150	E	30M	T	T
2N2937	S	N			LPA	300M	A	175	60	55	0	100	300	10*	0.3	2.0M	150	E	30M	T	T
2N2938	S	N			HSS	300M	A	200	25	13	0	30		50M	0.4	50M			500M	T	T
2N2939	S	N			HFA	0.8W	A	300	75	60	0	60	240	0.15A	0.75	0.15A			150M	T	T
2N2940	S	N			HFA	0.8W	A	300	120	80	0	60	240	0.15A	0.75	0.15A			150M	T	T
2N2941	S	N			HFA	0.8W	A	200	150	100	0	60	240	0.15A					150M	T	T
2N2942	G	P			HSS	150M	A	100	50	25	0	50		10M	0.15	10M			150M	T	T
2N2943	G	P			HSS	150M	A	100	30	15	0	30		10M	0.2	10M			120M	T	T
2N2944	S	P			CHP	400M	A	175	15	10	0	80		1.0M					10M	T	T
2N2944A	S	P			CHP	400M	A	200	15	10	0	100		1.0M					15M	T	T
2N2945	S	P			CHP	400M	A	175	25	20	0	40		1.0M					5.0M	T	T
2N2945A	S	P			CHP	400M	A	200	25	20	0	100		1.0M					10M	T	T
2N2946	S	P			CHP	400M	A	175	40	35	0	30		1.0M					3.0M	T	T
2N2946A	S	P			CHP	400M	A	200	40	35	0	50		1.0M					5.0M	T	T
2N2947	S	N		9-35	MFA	25W	C	175	60	60	S	2.5	55	0.4A	0.5	1.0A			100M	T	T
2N2948	S	N		9-35	MFA	25W	C	175	40	40	S	2.5	100	0.4A	0.5	1.0A			100M	T	T
2N2949	S	N		9-38	MFA	6.0W	C	175	60	60	S	5.0	100	40M	0.5	0.4A			100M	T	T
2N2950	S	N		9-38	MFA	6.0W	C	175	60	60	S	5.0	100	40M	0.5	0.4A			100M	T	T
2N2951	S	N		9-40	MFA	3.0W	C	175	60	60	S	20	150	10M	0.5	0.15A			200M	T	T
2N2952																					

GENERAL PURPOSE SWITCHING AND AMPLIFIER TRANSISTORS (SILICON)

Current versus Voltage

BV _{CEO} Min Volts	OPTIMUM COLLECTOR CURRENT									
	0 to 10 mA		10 mA to 100 mA		100 mA to 500 mA		500 mA to 1.0 A		1.0 A to 3.0 A	
	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP
15 ↓ 29	2N916 2N2330 2N2331		2N916 2N1983 2N1984		2N696 2N697 2N718 2N1420 2N2195	2N1991				
30 ↓ 39			2N2218 2N2219 2N2221 2N2222	2N3133 2N3134 2N3135 2N3136	2N2218 2N2219 2N2221 2N2222 2N3299 2N3300 2N3301 2N3302	2N2800 2N2801 2N2837 2N2838 2N3133 2N3134 2N3135 2N3136				
49 ↓ 59	2N758 2N795 2N760 2N915 2N929 2N930 2N3946 2N3947	2N3250 2N3251 MM4048	2N2218A 2N2219A 2N2221A 2N2222A 2N2224 2N3946 2N3947	2N3250 2N3251	2N2194 2N2218A 2N2219A 2N2221A 2N2222A	2N2904 2N2905 2N2906 2N2907 2N3485 2N3486 2N4890	2N2192 2N2193	2N3244 2N3245	2N3506 2N3507	
60 ↓ 79	2N758A 2N759A 2N760A 2N929A 2N930A MM2483 MM2484	2N3798 2N3799 2N3250A 2N3251A	2N910 2N911 2N1990	2N3250A 2N3251A	2N656 2N699	2N2904A 2N2905A 2N2906A 2N2907A 2N3485A 2N3486A				
80 ↓ 99	2N739 2N740	2N3494 2N3496	2N720A 2N1893 2N2405	2N3494 2N3496	2N720A 2N3019 2N3020		2N3019 2N3020			
100 ↓ 149	2N4924	2N3495 2N3497 2N4928	2N3498 2N3499 2N4924	2N3495 2N3497 2N3634 2N3635 2N4928	2N3498 2N3499 2N4924	2N3634 2N3635				
150 ↓ 249	2N3114 2N4925 2N4926	2N4929 2N4930	2N3500 2N3501 2N4925 2N4926	2N3635 2N3637 2N4929 2N4930	2N3500 2N3501 2N4925	2N3636 2N3637				
250 UP	2N3742 2N4927	2N3743 2N4931	2N3742 2N4927	2N3743 2N4931						

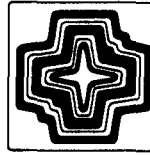
2N2218 (SILICON)

2N2219

2N2221

2N2222

2N2904 thru 2N2907

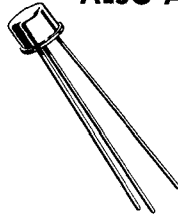


$V_{CEO} = 30-40\text{ V}$
 $f_T = 400\text{ MHz Typ}$

ALSO AVAILABLE AS JAN AND HI-REL UNITS



CASE 22
(TO-18)



CASE 31
(TO-5)

2N2221

2N2222

2N2906

2N2907

2N2218, 2N2219,

2N2904, 2N2905

Silicon annular star transistors for high-speed switching and DC to UHF amplifier applications. NPN types 2N2218 thru 2N2222 are complementary to PNP types 2N2904 thru 2N2907.

Collector connected to case

MAXIMUM RATINGS

Rating	Symbol	NPN	PNP	Unit
Collector - Base Voltage	V_{CB}	60	60	Vdc
Collector - Emitter Voltage	V_{CEO}	30	40	Vdc
Emitter - Base Voltage	V_{EB}	5	5	Vdc
Collector Current	I_C	800	600	mAdc
Total Device Dissipation @ 25°C Case Temperature To - 5: 2N2218, 2N2219 Derate Above 25°C 2N2904, 2N2905 Derate Above 25°C To - 18: 2N2221, 2N2222 Derate Above 25°C 2N2906, 2N2907 Derate Above 25°C	P_D	3		W
		20		mW/°C
			3	W
			17.2	mW/°C
Total Device Dissipation @ 25°C Ambient Temperature To - 5: 2N2218, 2N2219 Derate Above 25°C 2N2904, 2N2905 Derate Above 25°C To - 18: 2N2221, 2N2222 Derate Above 25°C 2N2906, 2N2907 Derate Above 25°C	P_D	1.8		W
		12		mW/°C
			1.8	W
			10.3	mW/°C
Total Device Dissipation @ 25°C Ambient Temperature To - 5: 2N2218, 2N2219 Derate Above 25°C 2N2904, 2N2905 Derate Above 25°C To - 18: 2N2221, 2N2222 Derate Above 25°C 2N2906, 2N2907 Derate Above 25°C	P_D	0.8		W
		5.33		mW/°C
			0.6	W
			3.43	mW/°C
Total Device Dissipation @ 25°C Ambient Temperature To - 5: 2N2218, 2N2219 Derate Above 25°C 2N2904, 2N2905 Derate Above 25°C To - 18: 2N2221, 2N2222 Derate Above 25°C 2N2906, 2N2907 Derate Above 25°C	P_D	0.5		W
		3.33		mW/°C
			0.4	W
			2.28	mW/°C
Operating Junction Temperature	T_J	-65 to +175	-65 to +200	°C
Storage Temperature	T_{stg}	-65 to +200	-65 to +200	°C

2N2218 SERIES, 2N2904 SERIES (continued)

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

Static Characteristic	Fig. No.	Symbol	Min	Max	Unit
Collector-Base Breakdown Voltage ($I_C = 10\text{ }\mu\text{A}$, $I_E = 0$)	---	BV_{CBO}	60	---	Vdc
Collector-Emitter Breakdown Voltage* ($I_C = 10\text{ mA}$, $I_B = 0$)	9	BV_{CEO}^*	30 40	---	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10\text{ }\mu\text{A}$, $I_C = 0$)	---	BV_{EBO}	5	---	Vdc
Collector Cutoff Current ($V_{CB} = 50\text{ Vdc}$, $I_E = 0$) ($V_{CB} = 50\text{ Vdc}$, $I_E = 0$, $T_A = 150^\circ\text{C}$)	---	I_{CBO}	---	.01 .02 10 20	μA
Collector Cutoff Current ($V_{CE} = 30\text{ Vdc}$, $V_{BE} = 0.5\text{ Vdc}$)	---	I_{CEX}	---	50	nA
Base Cutoff Current ($V_{CE} = 30\text{ Vdc}$, $V_{BE} = 0.5\text{ Vdc}$)	---	I_{BL}	---	50	nA
Collector-Emitter Saturation Voltage* ($I_C = 150\text{ mA}$, $I_B = 15\text{ mA}$) ($I_C = 500\text{ mA}$, $I_B = 50\text{ mA}$)	12, 15	$V_{CE(sat)}^*$	---	0.4 1.6	Vdc
Base-Emitter Saturation Voltage* ($I_C = 150\text{ mA}$, $I_B = 15\text{ mA}$) ($I_C = 500\text{ mA}$, $I_B = 50\text{ mA}$)	13, 16	$V_{BE(sat)}^*$	---	1.3 2.6	Vdc
DC Forward Current Transfer Ratio ($I_C = 0.1\text{ mA}$, $V_{CE} = 10\text{ Vdc}$)	10	h_{FE}	20	---	---
	11		35	---	---
($I_C = 1.0\text{ mA}$, $V_{CE} = 10\text{ Vdc}$)			25	---	---
			50	---	---
($I_C = 10\text{ mA}$, $V_{CE} = 10\text{ Vdc}$)			35	---	---
			75	---	---
($I_C = 150\text{ mA}$, $V_{CE} = 10\text{ Vdc}$)*			40	120	---
			100	300	---
($I_C = 500\text{ mA}$, $V_{CE} = 10\text{ Vdc}$)*			20	---	---
			30	---	---

Dynamic Characteristic	Fig. No.	Symbol	Min	Typ	Max	Unit
Output Capacitance ($V_{CB} = 10\text{ Vdc}$, $I_E = 0$, $f = 100\text{ kHz}$)	4	C_{ob}	---	---	8	pF
Input Capacitance ($V_{BE} = 0.5\text{ Vdc}$, $I_C = 0$, $f = 100\text{ kHz}$) ($V_{BE} = 2\text{ Vdc}$, $I_C = 0$, $f = 100\text{ kHz}$)	4	C_{ib}	---	---	30 30	pF
Current Gain - Bandwidth Product ($I_C = 20\text{ mA}$, $V_{CE} = 20\text{ Vdc}$, $f = 100\text{ MHz}$) ($I_C = 50\text{ mA}$, $V_{CE} = 20\text{ Vdc}$, $f = 100\text{ MHz}$)	8	f_T	250 200	---	---	MHz
Delay Time	1	t_d	---	6	10	ns
Rise Time	1	t_r	---	20	40	ns
Turn-On Time	1	t_{on}	---	26	45	ns
Storage Time	2	t_s	---	50	80	ns
Fall Time	2	t_f	---	20	30	ns
Turn-Off Time	2	t_{off}	---	70	100	ns
Total Switching Time	3	t_{total}	---	12	---	ns

*Pulse Test, Pulse Width $\leq 300\text{ }\mu\text{s}$ Duty Cycle $\leq 2\%$

PNP SWITCHING-TIME CIRCUITS

For NPN Switching Tests, reverse diodes, polarities, and input pulses.

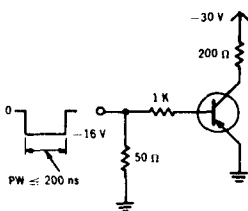


FIGURE 1 — SATURATED TURN-ON SWITCHING-TIME TEST CIRCUIT

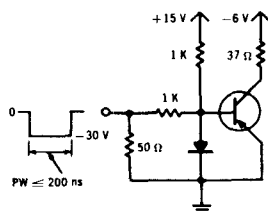


FIGURE 2 — SATURATED TURN-OFF SWITCHING-TIME TEST CIRCUIT

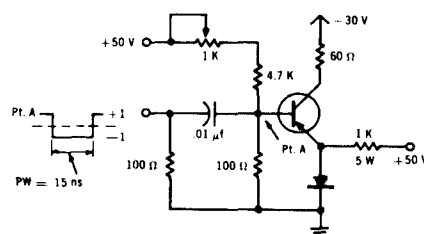
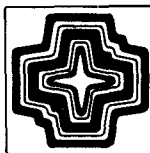
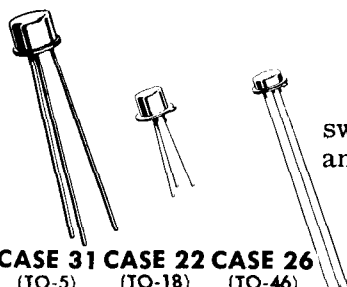


FIGURE 3 — NON-SATURATED SWITCHING-TIME TEST CIRCUIT

2N2904, A thru 2N2907, A (SILICON)
2N2904 thru 2N2907 USA/JAN and
HI-REL
2N3485, A, 2N3486, A



$V_{CEO} = 40-60 \text{ V}$
 $I_C = 600 \text{ mA}$
 $f_T = 200 \text{ MHz}$



PNP silicon annular Star transistors for high-speed switching, complementary circuitry and DC to VHF amplifier applications.

Collector connected to case

CASE 31 CASE 22 CASE 26
(TO-5) (TO-18) (TO-46)
 2N2904, A 2N2906, A 2N3485, A
 2N2905, A 2N2907, A 2N3486, A

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	Vdc
Collector-Emitter Voltage 2N2904-2N2907, 2N3485, 2N3486 2N2904A-2N2907A, 2N3485A, 2N3486A	V_{CEO}	40 60	Vdc
Emitter-Base Voltage	V_{EBO}	5	Vdc
Collector Current	I_C	600	mAdc
Total Device Dissipation @ $T_C = 25^\circ\text{C}$ TO-5: 2N2904, 2N2904A, 2N2905, 2N2905A DERATING FACTOR TO-18: 2N2906, 2N2906A, 2N2907, 2N2907A DERATING FACTOR TO-46: 2N3485, 2N3485A, 2N3486, 2N3486A DERATING FACTOR	P_D	3 17.2 1.8 10.3 2 11.43	W mW/ $^\circ\text{C}$ W mW/ $^\circ\text{C}$ W mW/ $^\circ\text{C}$
Total Device Dissipation @ $T_A = 25^\circ\text{C}$ TO-5: 2N2904, 2N2904A, 2N2905, 2N2905A DERATING FACTOR TO-18: 2N2906, 2N2906A, 2N2907, 2N2907A TO-46: 2N3485, 2N3485A, 2N3486, 2N3486A DERATING FACTOR	P_D	600 3.43 400 2.28	mW mW/ $^\circ\text{C}$ mW mW/ $^\circ\text{C}$
Operating Junction Temperature Range	T_J	-65 to +200	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-65 to +200	$^\circ\text{C}$

2N2904, A-2N2907, A and 2N3485, A, 2N3486, A (Continued)

ELECTRICAL CHARACTERISTICS (At 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
Collector Cutoff Current ($V_{CB} = 50 \text{ Vdc}$, $I_E = 0$) ($V_{CB} = 50 \text{ Vdc}$, $I_E = 0$, $T_A = 150^\circ\text{C}$)	I_{CBO}	---	.020 .010 20 10	μAdc
Collector Cutoff Current ($V_{CE} = 30 \text{ V}$, $V_{BE} = 0.5 \text{ V}$)	I_{CEX}	---	50	nAdc
Base Cutoff Current ($V_{CE} = 30 \text{ V}$, $V_{BE} = 0.5 \text{ V}$)	I_{BL}	---	50	nAdc
Collector-Base Breakdown Voltage ($I_C = 10 \mu\text{Adc}$, $I_E = 0$)	BV_{CBO}	60	---	Vdc
Collector-Emitter Breakdown Voltage* ($I_C = 10 \text{ mAdc}$, $I_B = 0$)	BV_{CEO}^*	40 60	---	Vdc
Emitter-Base Breakdown Voltage ($I_B = 10 \mu\text{Adc}$, $I_C = 0$)	BV_{EBO}	5	---	Vdc
Collector Saturation Voltage* ($I_C = 150 \text{ mAdc}$, $I_B = 15 \text{ mAdc}$) ($I_C = 500 \text{ mAdc}$, $I_B = 50 \text{ mAdc}$)	$V_{CE(sat)}^*$	---	0.4 1.6	Vdc
Base-Emitter Saturation Voltage ($I_C = 150 \text{ mAdc}$, $I_B = 15 \text{ mAdc}$)* ($I_C = 500 \text{ mAdc}$, $I_B = 50 \text{ mAdc}$)	$V_{BE(sat)}^*$	---	1.3 2.6	Vdc
DC Forward Current Transfer Ratio ($I_C = 0.1 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 1.0 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 10 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$) ($I_C = 150 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$)* ($I_C = 500 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$)*	h_{FE}	20 35 40 75 25 50 40 100 35 75 40 100 40 100 20 30 40 50	---	---
Output Capacitance ($V_{CE} = 10 \text{ Vdc}$, $I_E = 0$, $f = 100 \text{ kHz}$)	C_{ob}	---	8	pF
Input Capacitance ($V_{BE} = 2 \text{ Vdc}$, $I_C = 0$, $f = 100 \text{ kHz}$)	C_{ib}	---	30	pF
Current-Gain — Bandwidth Product ($I_C = 50 \text{ mAdc}$, $V_{CE} = 20 \text{ Vdc}$, $f = 100 \text{ MHz}$)	f_T	200	---	MHz

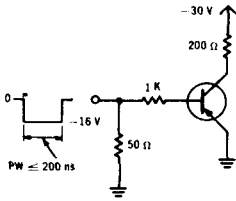
SWITCHING CHARACTERISTICS (At 25°C unless otherwise noted)

Characteristic	Symbol	Typ	Max	Unit
Delay Time	t_d	6	10	ns
Rise Time	t_r	20	40	ns
Turn-On Time	t_{on}	26	45	ns
Storage Time	t_s	50	80	ns
Fall Time	t_f	20	30	ns
Turn-Off Time	t_{off}	70	100	ns
Total Switching Time	t_{total}	12	---	ns

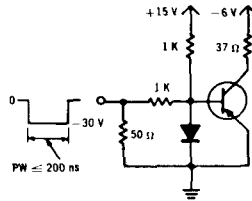
*Pulse Test: Pulse Width = 300 μs ; Duty Cycle $\leq 2\%$

2N2904, A-2N2907, A and 2N3485, A, 2N3486, A (Continued)

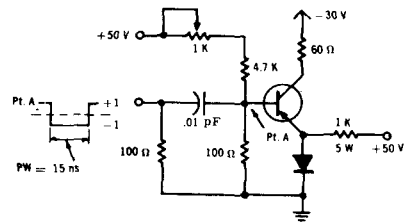
**SATURATED TURN-ON
SWITCHING-TIME TEST CIRCUIT**



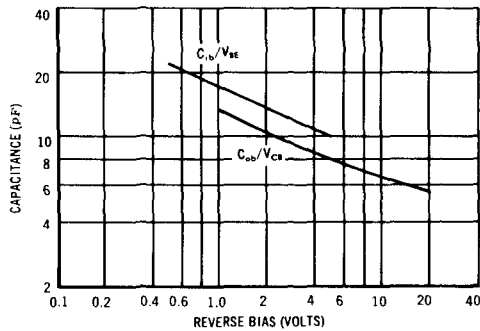
**SATURATED TURN-OFF
SWITCHING-TIME TEST CIRCUIT**



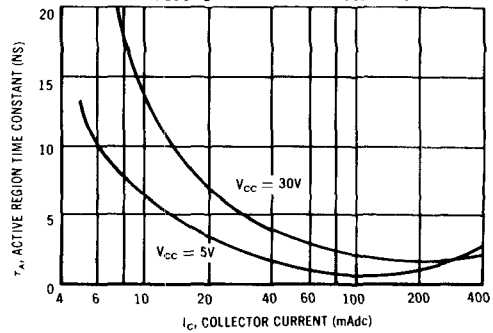
**NON-SATURATED SWITCHING-TIME
TEST CIRCUIT**



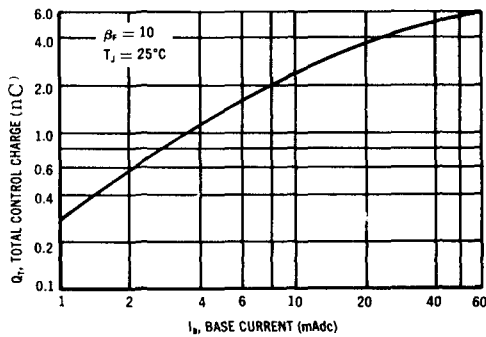
CAPACITANCE VARIATIONS versus VOLTAGE



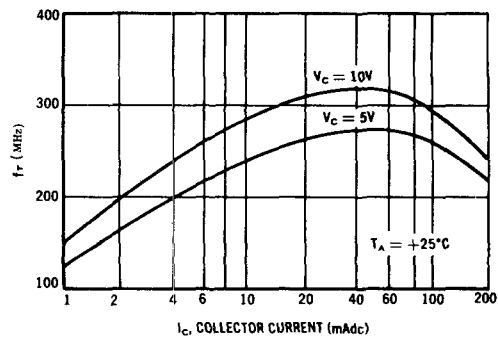
**ACTIVE REGION TIME CONSTANT
versus COLLECTOR CURRENT**



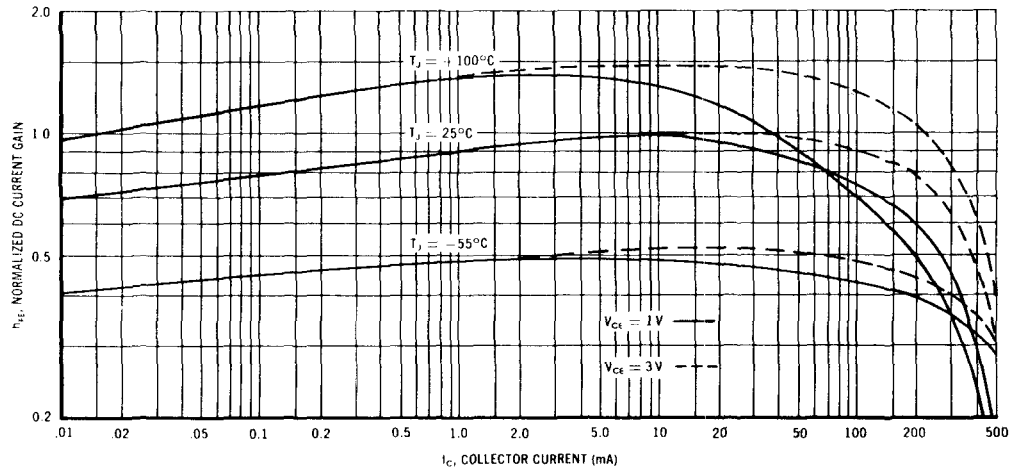
TOTAL CONTROL CHARGE versus BASE CURRENT



**CURRENT GAIN-BANDWIDTH PRODUCT versus
COLLECTOR CURRENT**

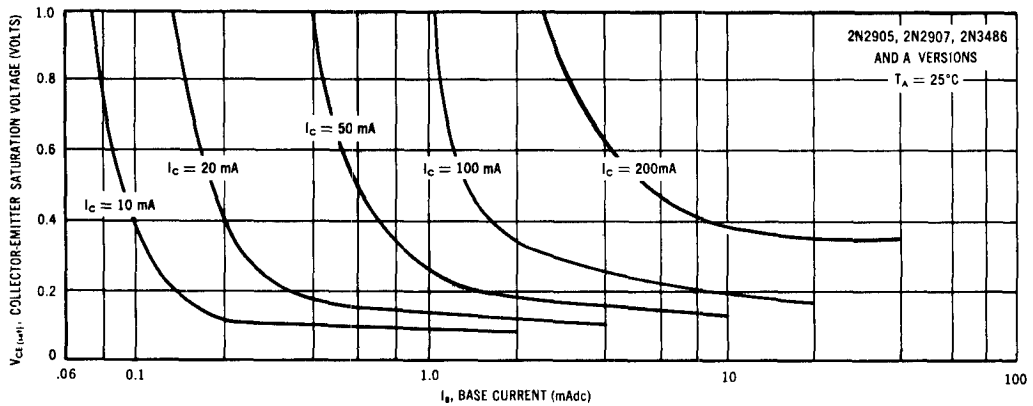
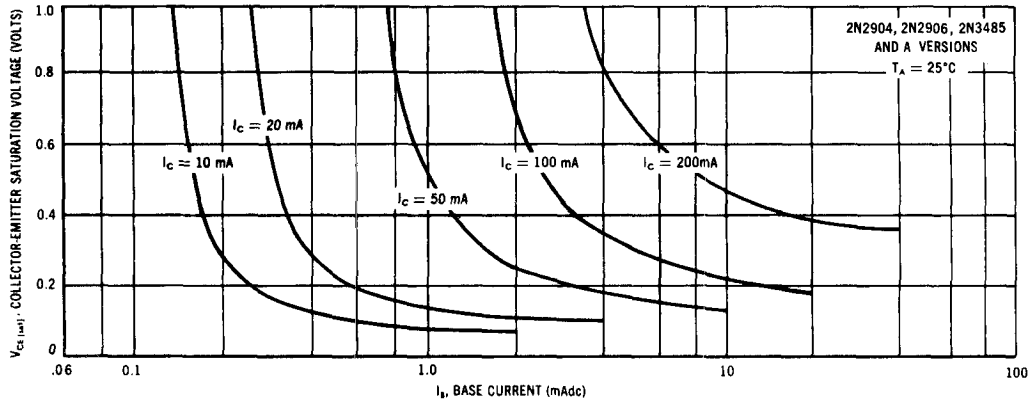


CURRENT GAIN versus COLLECTOR CURRENT

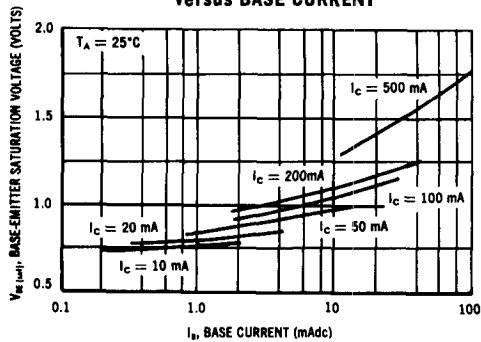


2N2904, A-2N2907, A and 2N3485, A, 2N3486, A (Continued)

COLLECTOR SATURATION VOLTAGE versus BASE CURRENT



**BASE SATURATION VOLTAGE
versus BASE CURRENT**



TEMPERATURE COEFFICIENTS

