

2N3374-2N3475

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	(volts)	Units					Units	Units
2N3374	S	N		9-74	HPA	5.0W	C	200	80	80	0	10	100	0.17A	0.3	0.15A			230M	T	
2N3375	S	N			HPA	11.6W	C	200	65	40	0	10	100	0.25A	1.0	0.25A			400M	T	
2N3376	thru																				
2N3387	Field Effect Transistors, see Table on Page 1-166																				
2N3388	S	N			MSS	0.6W	A	175	125	100	0	60		2.5M	1.0	2.5M			36M	T	
2N3389	S	N			MSS	0.6W	A	175	195	160	0	60		7.0M					36M	T	
2N3390	S	N	MPS6521	5-109	AFC	0.2W	A	125	25	25	0	400	800	2.0M			400	E			
2N3391	S	N	MPS6515	5-109	AFC	0.2W	A	125	25	25	0	250	500	2.0M			250	E			
2N3391A	S	N	MPS6520	5-109	AFC	0.2W	A	125	25	25	0	250	500	2.0M			250	E			
2N3392	S	N	MPS3392	5-86	AFC	0.2W	A	125	25	25	0	150	300	2.0M			150	E			
2N3393	S	N	MPS3393	5-86	AFC	0.2W	A	125	25	25	0	90	180	2.0M			90	E			
2N3394	S	N	MPS3394	5-86	AFC	0.2W	A	125	25	25	0	55	110	2.0M			55	E			
2N3395	S	N	MPS3395	5-86	AFC	0.2W	A	125	25	25	0	150	500	2.0M			150	E			
2N3396	S	N	MPS3396	5-86	AFC	0.2W	A	125	25	25	0	90	500	2.0M			90	E			
2N3397	S	N	MPS3397	5-86	AFC	0.2W	A	125	25	25	0	55	500	2.0M			55	E			
2N3398	S	N	MPS3398	5-86	AFC	0.2W	A	125	25	25	0	55	800	2.0M			55	E			
2N3399	G	P			RFC	80M	A	100	20	10	0	10		1.5M					400M	T	
2N3400	G	P			HSS	0.15W	A	100	20	20	0	50	300	10M	0.15	10M			150M	T	
2N3401	S	P			CHP	0.25W	A	150	25	25	0			0.25	5.0M	4.0		0.1M		B	
2N3402	S	N	MPS6513	5-109	AFC	0.56W	A	150	25	25	0	75	225	2.0M	0.3	5.0M	75				
2N3403	S	N	MPS6515	5-109	AFC	0.56W	A	150	25	25	0	180	540	2.0M	0.3	5.0M	180				
2N3404	S	N			AFC	0.56W	A	150	50	50	0	75	225	2.0M	0.3	5.0M	75				
2N3405	S	N			AFC	0.56W	A	150	50	50	0	180	540	2.0M	0.3	5.0M	100				
2N3406	Unijunction Transistor, see Table on Page 1-174																				
2N3407	S	N			RFA	0.2W	A	200	35	18	0	10	100	10M			10	E	300M	T	
2N3408	S	P			RFA	4.0W	A	200	40	25	0	10	100	40M			10	E	200M	T	
2N3409	S	N		11-33	DFA	0.5W	A	200	60	30	0	30	120	0.1M	0.15	10M			250M	T	
2N3410	S	N		11-33	DFA	0.5W	A	200	60	30	0	20	100	10*	0.15	10M			250M	T	
2N3411	S	N		11-33	DFA	0.5W	A	200	60	30	0	20	100	10*	0.15	10M			250M	T	
2N3412	G	P			AFA	60M	A	100	20	20	0	30	200	10M	0.2	10M	25	E	100M	T	
2N3413	S	P			AFA	0.4W	A	200	150	150	0	10	45	50M	1.2	0.1A			0.25M	T	
2N3414	S	N	MPS6513	5-109	AFC	0.36W	A	160	25	25	0	75	225	2.0M	0.3	5.0M	75	E			
2N3415	S	N	MPS6515	5-109	AFC	0.36W	A	160	25	25	0	180	540	2.0M	0.3	5.0M	180				
2N3416	S	N	MPS6515	5-109	AFC	0.36W	A	160	50	50	0	75	225	2.0M	0.3	5.0M	75	E			
2N3417	S	N	MPS6515	5-109	AFC	0.36W	A	160	50	50	0	180	540	2.0M	0.3	5.0M	100	E			
2N3418	S	N			PMS	0.8W	A	175	85	60	0	20	60	1.0A	0.25	1.0A			40M	T	
2N3419	S	N			PMS	0.8W	A	175	125	80	0	20	60	1.0A	0.25	1.0A			40M	T	
2N3420	S	N			PMS	0.8W	A	175	85	60	0	40	120	1.0A	0.25	1.0A			40M	T	
2N3421	S	N			PMS	0.8W	A	175	125	80	0	40	120	1.0A	0.25	1.0A			40M	T	
2N3422	Thyristor, see Table on Page 1-154																				
2N3423	S	N		11-35	DFA	0.3W	A	200	30	15	0	20	200	3.0M	0.4	10M			600M	T	
2N3424	S	N		11-35	DFA	0.3W	A	200	30	15	0	20	200	3.0M	0.4	10M			600M	T	
2N3425	S	N		11-35	HPA	0.3W	A	200	40	15	0	30	120	10M	0.4	10M	20	E	300M	T	
2N3426	S	N			HSS	0.6W	A	200	25	12	0	30	120	0.3A	0.33	0.3A			450M	T	
2N3427	G	P		6-41	AFA	0.2W	A	100	45	30	R	100	350	0.1A	0.2	0.1A	200	E	4.0M	T	
2N3428	G	P		6-41	AFA	0.2W	A	100	45	30	R	150	400	0.1A	0.19	0.1A	350	E	5.0M	T	
2N3429	S	N	2N3713	7-125	PMS	150W	C	175	50	50	0	10	35	5.0A	1.0	5.0A			20K	E	
2N3430	S	N	2N3714	7-125	PMS	150W	C	175	100	100	0	10	35	5.0A	1.0	5.0A			20K	E	
2N3431	S	N			PMS	150W	C	175	150	150	0	10	35	5.0A	1.0	5.0A			20K	E	
2N3432	S	N			PMS	150W	C	175	200	200	0	10	35	5.0A	1.0	5.0A			20K	E	
2N3433	S	N			PMS	150M	C	175	250	250	0	10	35	5.0A	1.0	5.0A			20K	E	
2N3434	S	N			PMS	150W	C	175	300	300	0	10	35	5.0A	1.0	5.0A					
2N3435	S	N			HPA	1.0W	A	200	80	60	0	50	200	10M					140M	T	
2N3436	thru																				
2N3438	Field Effect Transistors, see Table on Page 1-166																				
2N3439	S	N	MJ3201	7-200	VID	1.0W	A	200	450	350	0	40	160	20M			25	E	15M	T	
2N3440	S	N	MJ3202	7-200	VID	1.0W	A	200	300	250	0	40	160	20M			25	E	15M	T	
2N3441	S	N	2N3738	7-133	LPA	25W	C	200	160	140	0	20	80	0.5A	6.0	2.7A	15	E	0.2M	T	
2N3442	S	N			LPA	100W	C	200	160	140	0	20	70	3.0A	5.0	10A	12	E	80K	T	
2N3443	G	P			RFA	0.3W	A	100	20	15	0	20	150	10M			20	E	750M	T	
2N3444	S	N		8-214	HSS	1.0W	A	200	80	50	0	20	60	0.5A	0.35	0.15A			150M	T	
2N3445	S	N		7-111	LPA	115W	C	200	80	60	0	20	60	3.0A	1.5	3.0A	20	E	10M	T	
2N3446	S	N		7-111	LPA	115W	C	200	100	80	0	20	60	3.0A	1.5	3.0A	20	E	10M	T	
2N3447	S	N		7-111	LPA	115W	C	200	80	60	0	40	120	5.0A	1.5	5.0A	40	E	10M	T	
2N3448	S	N		7-111	LPA	115W	C	200	100	80	0	40	120	5.0A	1.5	5.0A	40	E	10M	T	
2N3449	G	P			HSS	150M	A	100	15	6.0	0	20		10M	0.2	2.0M			300M	T	
2N3450	S	N			HSS	0.6W	A	200	120	60	0	40	120	0.15A	0.5	0.15A			100M	T	
2N3451	S	P			HSS	0.3W	A	200	6.0	6.0	0	30	120	10M	0.16	10M			500M	T	
2N3452	thru																				
2N3460	Field Effect Transistors, see Table on Page 1-166																				
2N3461	C	P			LPA	5.0W	C	110	60	30	0	90	150	0.5A	0.4	1.0A	40	E	10K	E	
2N3462	S	N			LNA	0.3W	A	200	50	35	0	100	300	10*	0.35	5.0M	150	E	10M	T	
2N3463	S	N			LNA	0.3W	A	200	60	45	0	120	360	10*	0.35	1.0M	150	E	45M	T	
2N3464	S	N			HPA	5.0W	C	200	60	40	0	35	100	0.2A	1.0	0.2A	30	E	50M	T	
2N3465	thru																				
2N3466	Field Effect Transistors, see Table on Page 1-166																				
2N3467	S	P			HSS	1.0W	A	200	40	40	0	40	120	0.5A	0.3	0.15A			175M	T	
2N3468	S	P		8-225	HSS	1.0W	A	200	50	50	0	25	75	0.5A	0.35	0.15A			150M	T	
2N3469	S	N			HPA	1.25W	A	200	35	25	0	100	350	0.5A	0.5	1.0A	100	E	20M	T	
2N3470	S	N			LPA	150W	C	150	50	50	0	100	500	9.0A	3.5	9.0A	50	E	7.0K	E	
2N3471	S	N			LPA	150W	C	150	100	100	0	100	500	9.0A	3.5	9.0A	50	E	7.0K	E	
2N3472	S	N			LPA	150W	C	150	150	150	0	100	500	9.0A	3.5	9.0A	50	E	7.0K	E	
2N3473	S	N			LPA	150W	C	150	200	200	0	100	500	9.0A	3.5	9.0A	50	E	7.0K	E	
2N3474	S	N			LPA	150W	C	150	50	50	0	700	10K	4.0A	3.5	9.0A	100	E	4.0K	E	
2N3475	S	N			LPA	150W	C	150	100	100	0	700	10K	4.0A	3.5	9.0A	100	E	4.0K	E	

QUICK SELECTOR GUIDES — SILICON HIGH-SPEED SWITCHING AND GENERAL PURPOSE TRANSISTORS

The following two tables categorize the silicon devices included in this section into two classifications — those intended for general-purpose switching and amplifier applications, and those recommended primarily for high-speed saturated switching purposes.

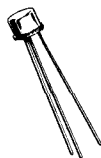
Only the preferred devices — those that merit first consideration for new designs — are listed. In each table, the devices are grouped in voltage and current ranges. The voltage given is the minimum collector-emitter breakdown voltage (BV_{CEO}). The current range columns represent operating current values for which optimum current gain (h_{FE}) and/or collector-emitter saturation voltage ($V_{CE(sat)}$) are specified in the data sheets.

SATURATED SWITCHING 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		3.0 A to 5.0 A	
	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP	NPN	PNP
0 ↓ 19	2N3010 2N3493 MM709 MM1748	2N2894 2N3546 2N4411	2N2369A 2N3009 2N3010 2N3011 2N3013 2N3210 2N3211	2N2894 2N3546	2N3009 2N3013 2N3510 2N3511 2N3647 2N3648		2N3303		2N3303			
20 ↓ 29	2N702 2N703		2N2501 2N3014 2N3227 2N3508 2N3509		2N2476 2N2477 2N2501 2N2847 2N2848							
30 ↓ 39			2N2537 2N2538 2N2539 2N2540		2N2537 2N2538 2N2539 2N2540 2N2845 2N2846 2N3015 2N3724 2N4013 2N4046		2N3252 2N3724 2N3734 2N3736 2N4013 2N4046		2N3734 2N3736			
40 ↓ 59			2N3725 2N4014		2N3725 2N4014 2N4047	2N3467 2N3468	2N3253 2N3444 2N3725 2N3735 2N3737 2N4014 2N4047	2N3467 2N3468 2N3762 2N3764	2N3444 2N3735 2N3737	2N3762 2N3764	2N3506 2N3507	
60 79								2N3763 2N3765		2N3763 2N3765		

2N3252, 2N3253 (SILICON)
(JAN2N3253 AVAILABLE)
2N3444

$V_{CEO} = 30-50 \text{ V}$
 $I_C = 1 \text{ A}$
 $f_T = 175-200 \text{ MHz}$



CASE 31
(TO-5)

NPN silicon annular transistors for high-current saturated switching and core driver applications.

Collector connected to case

MAXIMUM RATINGS

Rating	Symbol	2N3252	2N3253	2N3444	Unit
Collector-Base Voltage	V_{CB}	60	75	80	Vdc
Collector-Emitter Voltage	V_{CEO}	30	40	50	Vdc
Emitter-Base Voltage	V_{EB}	← 5 →			Vdc
Total Device Dissipation 25°C Case Temperature Derate above 25°C	P_D	← 5 → ← 28.6 →			Watts mW/°C
Total Device Dissipation 25°C Ambient Temperature Derate above 25°C	P_D	← 1.0 → ← 5.71 →			Watt mW/°C
Junction Operating Temperature Range	T_J	← -65 to +200 →			°C
Storage Temperature Range	T_{stg}	← -65 to +200 →			°C
Thermal Resistance:	θ_{JC}	35			°C/W
	θ_{JA}	0.175			°C/mW

SWITCHING CHARACTERISTICS

Characteristic		Symbol	Min	Max	Unit
Output Capacitance ($V_{CB} = 10 \text{ Vdc}$, $I_E = 0$, $f = 100 \text{ kHz}$)		C_{ob}	—	12	pF
Input Capacitance ($V_{EB} = 0.5 \text{ Vdc}$, $I_C = 0$, $f = 100 \text{ kHz}$)		C_{ib}	—	80	pF
Current Gain-Bandwidth Product ($I_C = 50 \text{ mAdc}$, $V_{CE} = 10 \text{ Vdc}$, $f = 100 \text{ MHz}$)		f_T	200	—	MHz
			175	—	
Total Control Charge ($I_C = 500 \text{ mAdc}$, $I_{B1} = 50 \text{ mAdc}$, $V_{CC} = 30 \text{ V}$)		Q_T	—	5	nC
Delay Time	$I_C = 500 \text{ mAdc}$, $I_{B1} = 50 \text{ mAdc}$ $V_{CC} = 30 \text{ V}$, $V_{BE} = 2 \text{ V}$	t_d	—	15	ns
Rise Time		t_r	—	30 35	ns
Storage Time	$I_C = 500 \text{ mAdc}$, $I_{B1} = I_{B2} = 50 \text{ mAdc}$ $V_{CC} = 30 \text{ V}$	t_s	—	40	ns
Fall Time		t_f	—	30	ns

2N3252, 2N3253, 2N3444 (continued)

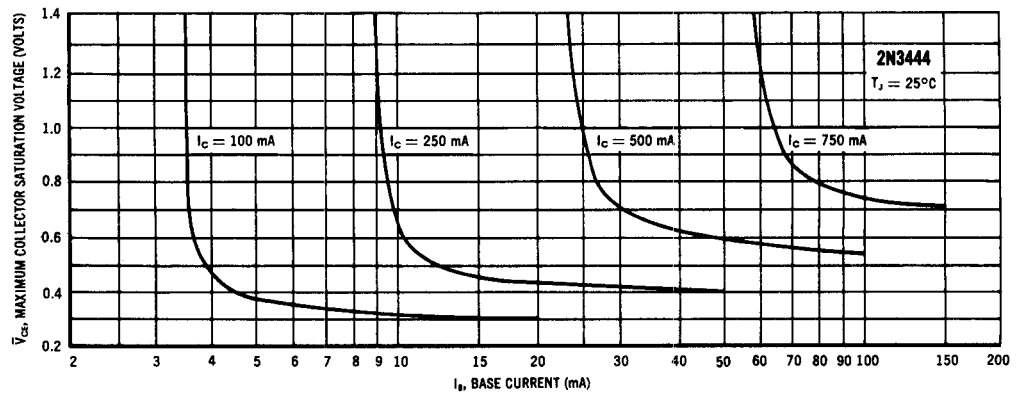
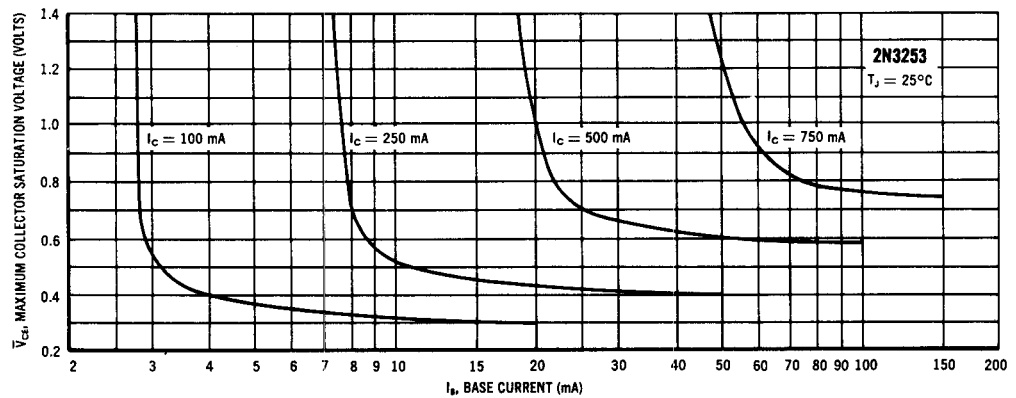
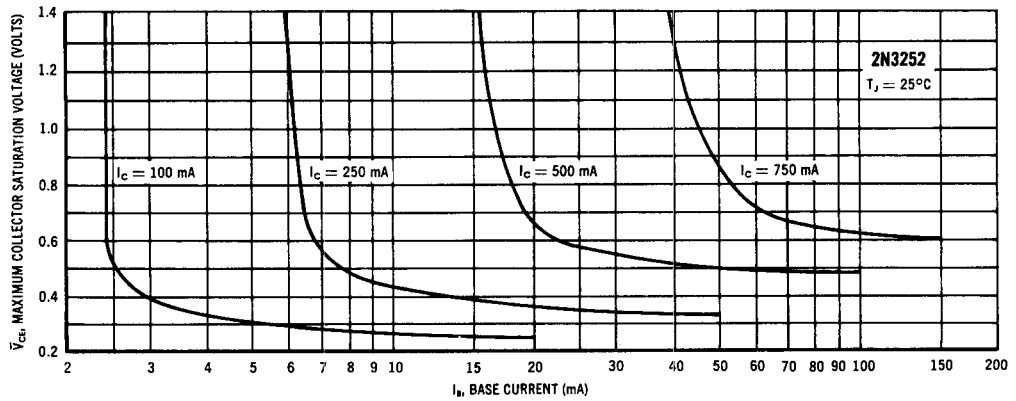
ELECTRICAL CHARACTERISTICS (At 25°C unless otherwise noted)

Characteristic	Symbol	Min	Max	Unit
Collector Cutoff Current ($V_{CB} = 40 \text{ Vdc}$, $I_E = 0$) 2N3252 ($V_{CB} = 40 \text{ Vdc}$, $I_E = 0$, $T_A = 100^\circ\text{C}$) 2N3252 ($V_{CB} = 60 \text{ Vdc}$, $I_E = 0$) 2N3253, 2N3444 ($V_{CB} = 60 \text{ Vdc}$, $I_E = 0$, $T_A = 100^\circ\text{C}$) 2N3253, 2N3444	I_{CBO}	—	0.50 75.0 0.50 75.0	μAdc
Emitter Cutoff Current ($V_{BE} = 4 \text{ Vdc}$, $I_C = 0$)	I_{EBO}	—	0.05	μAdc
Collector Cutoff Current ($V_{CE} = 40 \text{ Vdc}$, $V_{EB(\text{off})} = 4 \text{ Vdc}$) 2N3252 ($V_{CE} = 60 \text{ Vdc}$, $V_{EB(\text{off})} = 4 \text{ Vdc}$) 2N3253, 2N3444,	I_{CEX}	— —	0.5 0.5	μAdc
Base Cutoff Current ($V_{CE} = 40 \text{ Vdc}$, $V_{EB(\text{off})} = 4 \text{ Vdc}$) 2N3252 ($V_{CE} = 60 \text{ Vdc}$, $V_{EB(\text{off})} = 4 \text{ Vdc}$) 2N3253, 2N3444	I_{BL}	— —	0.50 0.50	μAdc
Collector-Base Breakdown Voltage ($I_C = 10 \mu\text{Adc}$, $I_E = 0$) 2N3252 2N3253 2N3444	BV_{CBO}	60 75 80	— — —	Vdc
Collector-Emitter Breakdown Voltage * ($I_C = 10 \text{ mAdc}$, pulsed, $I_B = 0$) 2N3252 2N3253 2N3444	BV_{CEO}^*	30 40 50	— — —	Vdc
Emitter-Base Breakdown Voltage ($I_E = 10 \mu\text{Adc}$, $I_C = 0$)	BV_{EBO}	5	—	Vdc
Collector Saturation Voltage * ($I_C = 150 \text{ mAdc}$, $I_B = 15 \text{ mAdc}$) 2N3252 2N3253, 2N3444 ($I_C = 500 \text{ mAdc}$, $I_B = 50 \text{ mAdc}$) 2N3252 2N3253, 2N3444 ($I_C = 1.0 \text{ Adc}$, $I_B = 100 \text{ mAdc}$) 2N3252 2N3253, 2N3444	$V_{CE(\text{sat})}^*$	— — — — — —	0.3 0.35 0.5 0.60 1.0 1.2	Vdc
Base-Emitter Saturation Voltage * ($I_C = 150 \text{ mAdc}$, $I_B = 15 \text{ mAdc}$) ($I_C = 500 \text{ mAdc}$, $I_B = 50 \text{ mAdc}$) ($I_C = 1.0 \text{ Adc}$, $I_B = 100 \text{ mAdc}$)	$V_{BE(\text{sat})}^*$	— 0.7 —	1.0 1.3 1.8	Vdc
DC Forward Current Transfer Ratio * ($I_C = 150 \text{ mAdc}$, $V_{CE} = 1 \text{ Vdc}$) 2N3252 2N3253 2N3444 ($I_C = 500 \text{ mAdc}$, $V_{CE} = 1 \text{ Vdc}$) 2N3252 2N3253 2N3444 ($I_C = 1 \text{ Adc}$, $V_{CE} = 5 \text{ Vdc}$) 2N3252 2N3253 2N3444	h_{FE}^*	30 25 20 30 25 20 25 20 15	— — — 90 75 60 — — —	—

* Pulse Test: Pulse width = 300 μs , duty cycle = 2%

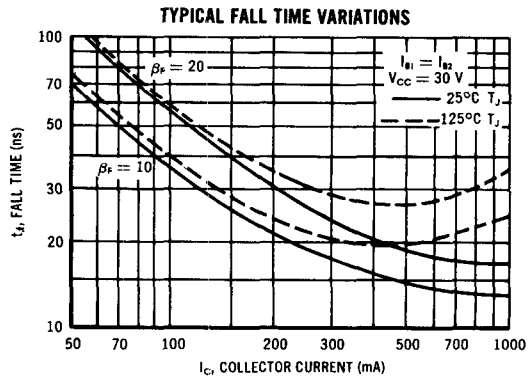
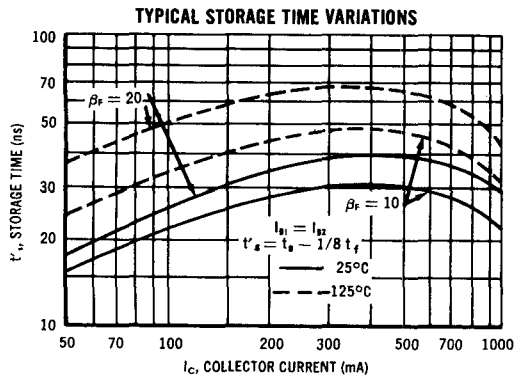
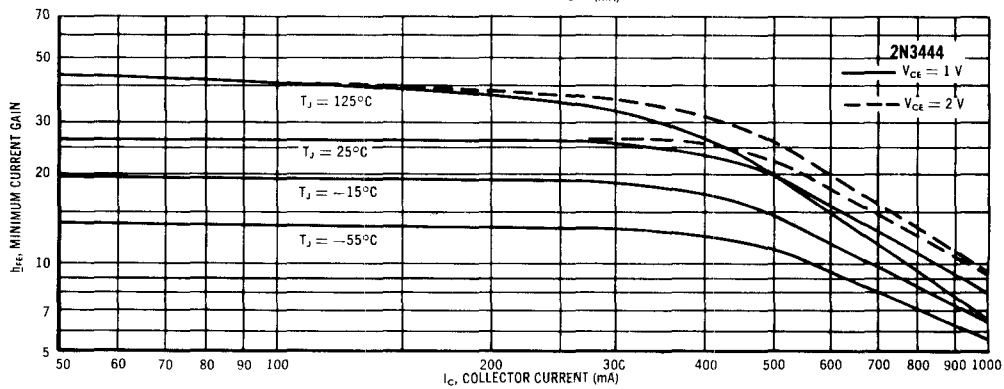
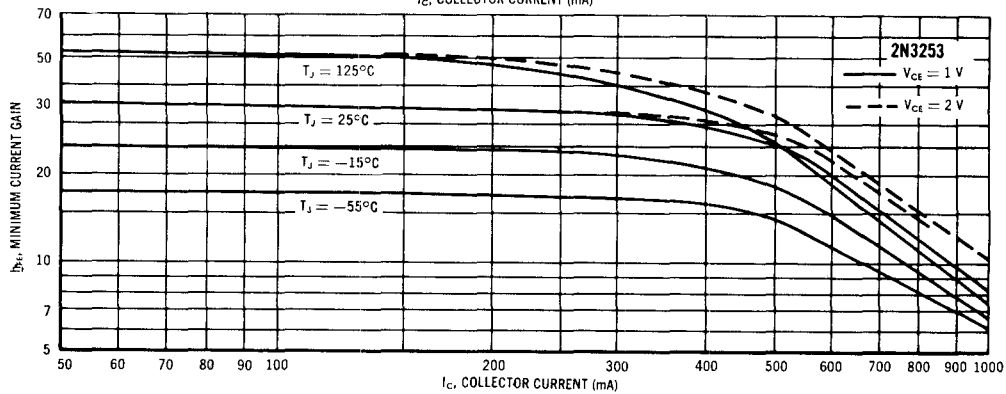
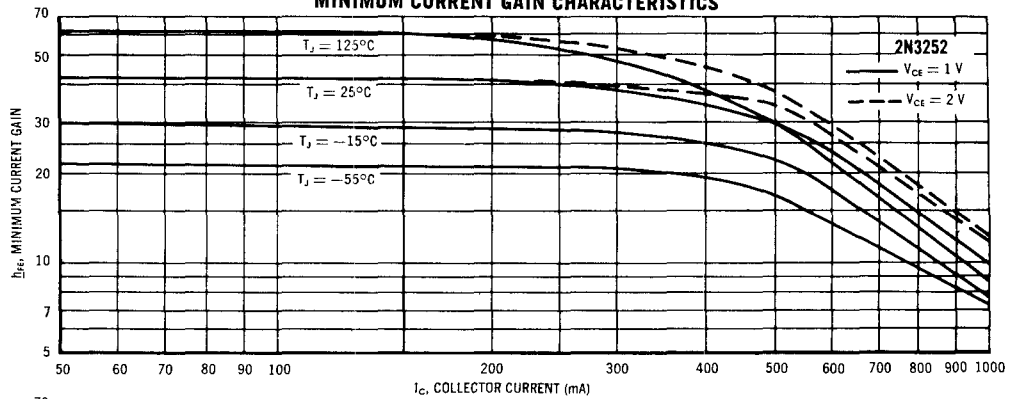
2N3252, 2N3253, 2N3444 (continued)

COLLECTOR SATURATION VOLTAGE CHARACTERISTICS



2N3252, 2N3253, 2N3444 (continued)

MINIMUM CURRENT GAIN CHARACTERISTICS



2N3252, 2N3253, 2N3444 (continued)

